ARCHIVES OF OPHTHALMOLOGY.

DOES JAVAL'S OPHTHALMOMETER RENDER THE USE OF ATROPINE UNNECESSARY?

By G. MELVILLE BLACK, M.D., Denver, Colo.,

EX-HOUSE SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL, NEW YORK; PROFESSOR OF LARYNGOLOGY AND RHINOLOGY IN THE MEDICAL DEPARTMENT, UNIVERSITY OF COLORADO.

AFTER using Javal's ophthalmometer continuously for two years and a half, I have arrived at the conclusion that it is sometimes deceptive; that it will register an astigmatism with or against the rule, when the eye will accept the cylinder in just the reverse axis from that indicated, even after careful tests under atropine. These instances are in the minority, but if such be the fact, even though the number be small, being about 14 per cent., yet it establishes the fact that it is not reliable to prescribe a pair of cylinders upon Javal's test alone. Dr. D. B. St. John Roosa sets forth his views on this matter in the *Medical Record* of March 26, 1892, and says: "It is easy by its use" (the ophthalmometer) "to exactly measure the corneal astigmatism in every case. We can, therefore, I believe, dispense with any mydriatic for the purpose of suspending the accommodation, except in very rare and entirely exceptional cases." He concludes his paper by saying: "The almost complete uselessness of paralyzing the accommodation, when we can now accurately and quickly determine the corneal astigmatism by the ophthalmometer is incidentally shown." Such emphatic statements coming from so high an authority naturally causes me to hesitate and wonder if there is anything amiss in my manner of using the ophthalmometer, that I cannot place more reliance on its readings.

But having been so fortunate as to have been taught to use the instrument by Dr. Roosa, and having used it under his directions for about a year and a half, I naturally feel that I have mastered the instrument, and am using it with precision and accuracy. I find it one of the greatest aids in refraction work, in advance of the ophthalmoscope for that purpose. I would not be without it in my office, and use it as one of my tests in every case of refraction. I, however, have not found it sufficiently accurate to prescribe glasses by it alone. What I mean by alone is, for instance: a patient gives every subjective symptom of eye strain yet will accept no glass. Javal's ophthalmometer shows 1 D ast. with the rule, *i. e.*, ax. 90° for a + cyl., and ax. 180° for a − cyl. The ophthalmoscope is indefinite, shows the eye to be hypermetropic between one half and one dioptry. Would it be right to give this patient cylinders according to Javal's test alone, which we would be doing in this instance, all our other tests being negative? I presume, then, we would be committing no error in such cases to subtract one half dioptry if with the rule, and add one half dioptry if against the rule, from Javal's reading, and give him the cylinders, whether he accepts them or not. I am not in accord with such a view of the case, for it is probable that if atropine or homatropine were used no cylinder at all would be accepted, and if one were accepted it would be exactly in the opposite axis to that indicated by Javal's ophthalmometer.

I find in almost all of my young patients that I cannot satisfy myself sufficiently as to their exact refraction without using some form of mydriatic to suspend the action of the ciliary muscle. I find that homatropine answers the purpose admirably, using a two-per-cent. solution every ten minutes for an hour, with an occasional drop of four-per-cent. cocaine. Or putting a specially prepared disk of $\frac{1}{60}$ grain each, cocaine and homatropine (manufactured by Wyeth) into the conjunctival sac, and having patient sit with closed lids for an hour, when the accommodation will be found completely paralyzed in almost every instance. I prefer the disk to the solution, owing to its being less troublesome and no danger of getting physiological effects,

which will sometimes happen when using the solution in anæmic females.

In looking over my case books I find a great number of cases which corroborate my remarks. I will cite a few that have accepted the cylinders in radically the opposite axis from that indicated by Javal. These patients came to me complaining of the various forms of asthenopia, and by the glasses prescribed and appropriate constitutional treatment have been relieved of their trouble.

CASE 1.—Miss J. T., aged twenty-eight.
O D V = $\frac{20}{200}$; $\frac{20}{15}$ w − 1.75 s ⊂ − .50 cyl. ax. 75°
O D V = $\frac{20}{200}$; $\frac{20}{15}$ w − 1.75 s ⊂ − .50 cyl. ax. 105°
Javal's oph. = O D 1 ax. 75°, O S 1 ax. 105°
Ophthalmoscope = M.
Under homatropine. { O D V = $\frac{20}{200}$: $\frac{20}{15}$ w − 1.50 s ⊂ − .50 cyl. ax. 75°
{ O S V = $\frac{20}{200}$: $\frac{20}{15}$ w − 1.50 s ⊂ − .75 cyl. ax. 105°

Javal's ophthalmoscope shows this case to have an astigmatism with the rule, and yet minus cylinders are accepted against the rule.

CASE 2.—Mr. H. G. M. Age twenty-six.
O D V = $\frac{20}{30}$; accepts + .75 cyl. ax. 105°
O S V = $\frac{20}{30}$; accepts + .75 cyl. ax. 75°
Javal's oph. = O D and O S 1 D ax. 90°
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{70}$: $\frac{20}{15}$ w + 1.50 s ⊂ + .25 cyl. ax. 135°
{ O S V = $\frac{20}{70}$: $\frac{20}{15}$ w + 1.25 s ⊂ + .25 cyl. ax. 150°

This case was under homatropine twice. Same result each time.

CASE 3.—Mrs. M. G. Age twenty-eight.
O D V = $\frac{20}{30}$; $\frac{20}{15}$ w .50 cyl. ax. 180°
O S V = $\frac{20}{30}$; $\frac{20}{15}$ w .50 cyl. ax. 180°
Javal's oph. = O D and O S .50 ax. 90° both.
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{40}$: $\frac{20}{15}$ w + .50 cyl. ax. 180°
{ O S V = $\frac{20}{40}$: $\frac{20}{15}$ w + .50 cyl. ax. 180°

CASE 4.—Mr. H. T. J. Age twenty-four.
O D V = $\frac{20}{30}$; $\frac{20}{15}$ w .75 cyl. ax. 180°

O S V = $\frac{10}{10}$; $\frac{10}{10}$ w .75 cyl. ax. 180.
Javal's oph. = O D and O S = 1 D ax. 90°.
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{100}$; $\frac{10}{10}$ − w + .50 s ⊃ + 1 cyl. ax. 180°
O S V = $\frac{20}{100}$; $\frac{10}{10}$ − w + .50 s ⊃ + 1 cyl. ax. 180°

CASE 5.—Mrs. W. M. H. Age sixty.
O D V = $\frac{6}{200}$; $\frac{10}{10}$ w − 4.50 s ⊃ − 1 ax. 180°
O S V = $\frac{6}{200}$; $\frac{10}{40}$ w − 4.50 s ⊃ − 1 ax. 180
Javal's oph. = O D and O S 2 D ax. 180
Ophthalmoscope = M.

Owing to patient's age a mydriatic was unnecessary. Javal shows the astigmatism to be against the rule, and the eyes accept the minus cylinders with the rule. I examined her three different times, obtaining the same result each time.

CASE 6.—Miss J. F. Age twelve.
O D V = $\frac{10}{10}$; $\frac{10}{10}$ w + .50 s ⊃ + .50 cyl. ax. 180°
O S V = $\frac{10}{10}$; $\frac{10}{10}$ w + 1 s.
Javal's oph. = O D = 1.50 ax. 75°, O S 1.50 ax. 105°
Ophthalmoscope = H.
Under atropine three days { O D V = $\frac{10}{10}$; $\frac{10}{15}$ w + .25 s ⊃ + .25 ax. 180°
O S V = $\frac{10}{10}$; $\frac{10}{15}$ w + .25 s ⊃ + .25 ax. 90°

CASE 7.—Mr. L. G. Age forty-one.
O D V = $\frac{10}{10}$
O S V = $\frac{10}{10}$ accepts no glass.
Javal's oph. = .50 ax. 90° both.
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{10}{10}$; $\frac{10}{15}$ w + .50 cyl. ax. 10°
O S V = $\frac{10}{10}$; $\frac{10}{15}$ w + .50 cyl. ax. 170°

CASE 8.—Miss L. M. Age twenty-four.
O D V = $\frac{10}{10}$; $\frac{10}{15}$ w + .25 s ⊃ + .50 cyl. ax. 90°
O S V = $\frac{10}{10}$; $\frac{10}{15}$ w + .50 cyl. ax. 180° ⊃ − .25 cyl. ax. 90°
Javal's oph. = .50 ax. 90° both.
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{10}{10}$; $\frac{10}{15}$ w + .50 s ⊃ + .50 cyl. ax. 180°
O S V = $\frac{10}{10}$; $\frac{10}{15}$ w + .75 cyl. ax. 180°.

CASE 9.—Mrs. W. B. Age twenty-six.
O D V = $\frac{10}{10}$; $\frac{10}{15}$ w − .50 ax. 70°
O S V $\frac{10}{10}$; $\frac{10}{15}$ w + .50 s.

Javal's oph. = O D 1 D ax. 135°, O S = 1 D ax. 105°
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{40}$; $\frac{20}{15}$ w + .50 s ⊂ + .50 cyl. ax. 165°
O S V = $\frac{20}{40}$; $\frac{20}{15}$ w + .75 s.

CASE 10.—Miss J. T. Age nine.
O D V = $\frac{20}{30}$
O S V = $\frac{20}{30}$ accepts no glass.
Javal's oph. = O D .75 ax. 45° O S 1 ax. 90°
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{30}$; $\frac{20}{15}$ w + .50 s ⊂ + .25 cyl. ax. 45°
O S V = $\frac{20}{40}$; $\frac{20}{15}$ w + .50 cyl. ax. 170°

I am very positive about the axis indicated in left eye by the ophthalmometer being at 90°. And yet she persisted in taking it at 170° at three different tests under homatropine.

CASE 11.—Miss A. T. Age eight.
O D V = $\frac{20}{30}$
O S V = $\frac{20}{30}$ accepts no glass.
Javal's oph. = O D 1 ax. 60°, O S 1 ax. 90°
Ophthalmoscope = H.
Under homatropine { O D V = $\frac{20}{20}$; $\frac{20}{15}$ w + .50 s ⊂ + .50 cyl. ax. 60°
O S V = $\frac{20}{20}$; $\frac{20}{15}$ w + .50 s ⊂ + .50 cyl. ax. 180°

I think I have cited sufficient cases to show that the ophthalmometer is sometimes in error, and that its addition to our armamentarium, while of inestimable value, does not enable us to do away with atropine in young people. It may be difficult for those not familiar with the Instrument to understand the meaning of *with*, and *against the rule*. *With the rule* is where the pointer of the instrument indicates the axis of the meridian of lesser corneal curvature to be at 90° or thereabout, and the two small pointers, projecting outward from each of the mires, shows the axis of the greater corneal curvature to be at 180° or thereabout. To correct this astigmatism, according to Javal, a plus cylinder should be placed before the eye with its axis at 90°, so as to add on to the lesser corneal curvature, or a minus cylinder can be used, its axis being placed at 180° so as to subtract from the meridian of greatest corneal curvature. By the term *against the rule* we mean a condition just

the reverse of the former—*i. e.*, where the instrument shows the axis of the meridian of the lesser corneal curvature to be at 180° and the axis of the greater at 90°. To correct this, according to Javal, a plus cylinder should be placed at 180° or a minus cylinder at 90°. Those who do a great deal of refraction work know that the majority of plus cylinders are accepted at 90° or thereabout and the majority of minus cylinders at or about 180°.

This condition of affairs being in the majority, the minority represents the eyes which accept plus cylinders at 180° and minus cylinders at 90°. And from this come the terms *with the rule* and *against the rule*, the former representing the majority and the latter the minority.

OPTIC NERVE ATROPHY IN A CHILD, FOLLOWING A FALL ON THE HEAD, WITH SEVERE CEREBRAL SYMPTOMS.

By S. KOHN, M.D., New York.

In the early part of March, 1891, I was called to see Hermann Hoexter, æt. seven years. I found him in bed, almost completely comatose.

History: In the morning of the day of my visit, whilst sliding down the banister in the hall of the house where he lives, he fell over the railing of the balustrade, about five steps from the floor, and struck the carpeted floor on the left side of his head, in the parieto-temporal region.

Status Præsens: Respiration regular; pulse normal, not slowed; pupils equally dilated; no response to light. Sensorium so benumbed, that it is impossible to make him answer questions that are asked in the loudest tone of voice possible in a room; calling loud into his ear does not make any impression, and his eyes remain fixed; occasionally he would groan in answer to our questions.

Diagnosis: Cerebral concussion. Ordered calomel, which acted fairly. The following day, the stupor if anything was deeper.

Dr. G. W. Jacoby saw him with me and thought he detected a paralysis of the left arm, because when he lifted it from the bed it fell back limp and lifeless, which was not the case with the right.

Needles introduced into the thighs and calves produced no reflex; but tickling the soles of the feet produced slight reflex contractions of the muscles of the lower limbs.

Dr. Jacoby's prognosis was decidedly unfavorable. His diag-

nosis: hemorrhage into the brain from a fracture of the inner table of the skull on the right side by *contre-coup*. He thought the only chance lay in trephining the skull on the right side.

In the afternoon we met Dr. F. Lange in consultation. He also thought the prognosis grave, not, however, so decidedly unfavorable as Dr. Jacoby, and advised a delay of twenty-four hours before operating. Calomel and jalap were administered in large doses. The following morning after a most thorough purging, the boy became conscious (the fourth day after the injury), and answered our questions, and thereafter made a rapid recovery.

There was a slight rise of temperature, the highest being 101° F. in the rectum. At no time was the pulse slow, intermittent, or irregular.

I should have stated above, that the coma did not set in immediately after the fall. The boy walked upstairs after he fell, told his mother of the accident, complained of headache, and in the course of four or five hours lapsed into unconsciousness, shortly after which he vomited twice. During the coma, lasting seventy-two hours or thereabouts, he was fed from a spoon, swallowing whatever liquids were given him in this way.

When he had been out of bed a few days his mother called my attention to his eyes, and upon examining them I found that he could not see my fingers with the left eye.

Dr. Born saw him with me and found nothing specially noteworthy in the optic disk, but thought that, in all probability, the fracture of the skull, produced by the fall, must have compressed or cut through the optic nerve.

I had noticed a depression of the skull at the point where the left external angular process of the frontal bone meets the frontal process of the malar, and it seemed to me that this depressed fracture must have resulted in a hemorrhage on the anterior surface of the frontal lobe, because the coma came on slowly.

The crushing in of the skull at this point must have produced such a narrowing of the optic foramen that the nerve was completely compressed or cut through.

The hemorrhage cannot have been of large extent, because the recovery without any permanent paralysis was too

rapid; still we must consider that there was some compression of the brain either by the skull or by a clot, to account for the coma lasting over seventy-two hours.

At present, a year after the injury, the boy is perfectly well, except that he is totally blind in the left eye, which shows optic nerve atrophy.

The case is instructive as showing the great reparative and recuperative powers of the child's brain, also its powers of resistance, and is further instructive in showing the care which should be exercised in giving a decided prognosis in any given case of injury to a child's brain. In this case, the decidedly unfavorable prognosis of Dr. Jacoby plunged the parents of the boy into the deepest grief.

ON SYNERGETIC OCULAR MOVEMENTS.

By Dr. O. BULL, Christiania, Norway.

IF we look through the modern ophthalmological literature, we shall find that the doctrine of cortical localization has not modified our opinions on the ocular movements in such a degree as should be expected. The oculists are yet far from appreciating alterations in the cortical centres as a cause of pathological alterations or physiological abnormities to such an extent as the neurologists for the present do. There are certainly some authors who take this factor into due regard, but most of the publications on this subject show that the greater number of ophthalmologists are still, in this respect, entangled in opinions which must be considered obsolete. The latest handbooks may serve as proof of this. Mauthner,[1] for instance, states that experimental investigation, clinical and pathologico-anatomical observations do not admit the introduction of cortical palsy of the ocular muscles. This can only be taken into account as regards the levator palpebrarum, although even this most probably is caused by nuclear alterations. Later on[2] he seems to admit the existence of cortical centres, having observed a case in which the upward movements of the eyes could not be made without an extraordinary effort on the part of the patient. This case, he says, proves, beyond doubt, a peculiar centre for raising the eyes. H. D. Noyes[3] has adopted the opinion of Mauthner.

[1] *Vorträge aus der Augenheilkunde*, 1889, Bd. ii., p. 388, and following.
[2] *Ibid.*, p. 688.
[3] *Diseases of the Eye.* New York, 1890.

Landolt et Eperon[1] admit that cortical centres exist, but maintain that we cannot yet give even an approximate idea of their situation.

Scepticism is certainly needed in medicine, but sometimes it may be exaggerated. To doubt the existence of cortical centres for the movements of the eyes would necessarily lead one to doubt the whole doctrine of cortical localization, and we might then just as well adopt the opinion already given up by Andral sixty years ago.

That cortical centres for volitional movements of the eyes exist is just as well founded upon physiological experiments, upon pathologico-anatomical and clinical observations, as those for any other volitional movements. To deny this would be to set aside the investigations by Hughlings Jackson, Hitzig, Ferrier, etc., and fall back on theories quite useless for the purpose of explaining facts easily explicable, if we adopt the theory of cortical localization.

Certainly there is much left to be elucidated concerning the motor centres of the eyes and of the fibres going to and from them, but the same may be said about the nuclei and their reciprocal relations. The latest investigations of Westphal, Darkschewitsch, and Perlia have served mostly to show how defective our knowledge in this matter hitherto has been.

It seems as if the oculists generally have taken but little pains in trying to explain physiological and pathological eye movements, in accordance with the theory of cortical localization. This is the more remarkable, as we have here to cope with the same questions as when other palsies are to be explained.

The situation of the centres for the volitional eye movements —and for those conducted through the eye-branch of the facial—is *most probably at the base of the first and second frontal gyri.*[2] Most likely all the centres for each eye lie

[1] L. de Wecker et G. Landolt, *Traité complet d'Ophtalmologie*, Paris, 1887. t. iii.

[2] That the motor centres of the eye should be located in the occipital lobe or in gyrus angularis, as some authors believe, is improbable, merely for the reason that these are beyond the motor region. That irritations of the said parts produce movements of the eyes, may be explained by the visual impressions thereby occasioned. That deviations or immobility of the globes sometimes

on the opposite side of the brain, analogous to those of the limbs.[1] This does not, however, involve the independent action on each side. We must here keep in mind the predominant influence of the visual impressions which counteract unsymmetrical movements as being repugnant to binocular sight.

From the mode of the movements it must be inferred, that impulses are not forwarded to each muscle separately, but to sets of muscles acting synergetically. This is *a priori* probable from the reason that the organ of vision is our chief reliance in surveying space. For this purpose movements in six directions, corresponding to the three dimensions of space,—viz., upward and downward, to the right and to the left, inward and outward — would suffice. Both experiments and clinical facts argue in favor of the theory that both cortical centres for the muscles acting synergetically, and the fibres leading the synergetic impulses, are in close local relationship. Concerning the centres, the question was settled already by Hitzig. He and after him Ferrier and others have by irritation of the motor centres obtained a deviation of both eyes in a sidewise direction—sideways and somewhat upward. Deviations in any other direction have not up to date, as far as I know, been obtained by experiments, obviously because these were not done on both sides simultaneously. In 1890 Mott and Schäfer,[2] however, have produced conjugated deviations up and down as well as adduction and abduction, by irritating at the same time corresponding places of the corticalis. They have found in the motor-region three zones, 1, upper-

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are found by destructive processes of the occipital lobe, does not prove that the motor centre is located there. So long as we do not know through which paths the impulses from the volontorium are transmitted to the motor-centres, nothing can be derived from such facts. To suppose that the occipital lobe is the seat of the motor centre is inconsistent with the fact that extirpation of this lobe does not produce palsy. That blindness without palsies repeatedly has been observed from destructive processes of the corticalis in this region, makes it rather certain that the perception-centre is located there.

[1] Already Hitzig, *l. c.*, p. 44, maintained that the centres lie on the opposite side, and he believed he had proved a separate centre at least for each of the four recti.

[2] "On Associated Eye-Movements Produced by Cortical Paradization of the Monkey Brain. *Brain*, t. ii., 1890. I know their *mémoire* only by a short abstract in *Forschritte der Medicin*, Bd. ix., 1891.

most, governing the movements downward; 2, an intermediate for movements to the opposite side; 3, a lower for the movements upward and to the opposite side. The same effect was obtained for one eye only, when the corpus callosum or the motor centres in the corticalis of the opposite side were destroyed. Analogous results were produced by irritation of certain places in the occipital lobe. By simultaneous irritation of centres, having an antagonistic action, in the frontal and occipital lobes, the result from the former was in preponderance.

Already before Hitzig made his experiments Hughlings-Jackson directed the attention to the motor function of some parts of the corticalis. He showed that by irritative processes in certain gyri of the great hemispheres, cramp can result, but that cramp does not attack a single muscle, or set of muscles at random, but a highly specialized set of muscles governing the movements to the side and upward. If destructive processes are present, palsies will result, and then the same muscles are attacked.[1] That the deviations are by affections of the great hemispheres, almost exclusively in side-direction, is in accordance with the experiments.

These lateral conjugate deviations have been much discussed since Prevost in 1868 wrote his work. Deviations in other directions have been hitherto but little heeded, although Priestley Smith and Parinaud several years ago have directed attention to them. The latter divides the synergetic movements into parallel and non-parallel. As the first are made in four, the latter in two, directions, his scheme is in conformity with that of Donders and Hering. Disturbances in one or more of the four pairs, turning the eyes in parallel directions, correspond consequently to what has been described as associated or compensatory palsies. Defects in non-parallel directions have been usually not recognized as palsies. Many cases are, no doubt, related under the neutral denomination "insufficiency of the recti."

About the above-named palsies and their significance in

[1] That the deviation is caused by palsy of the antagonists was concluded by Andral already in 1834.

determining the kind of innervation of the synergetic muscles, some words may here be said.

Parinaud states that palsies of the different ocular muscles[1] (turners, rotators) are not at all rare. I think every oculist who has his mind directed to this subject soon will be able to corroborate this. The frequency of the palsies of the different turners is, however, not alike. In the most cases the side-turners are attacked. An incomplete palsy of one of these turners is, in affections of the great hemispheres, according to some authors (Parinaud, Leichtenstern), very commonly found, but mostly overlooked, as the tonus of the affected muscles need not be so much diminished that the eyes are brought by the antagonists to the opposite side. Anyhow the cases of acquired weakness of one of these turners already referred to are so numerous that a publication of more, at least when these are not elucidated by a post-mortem examination, must be regarded as superfluous. Otherwise, with the bilateral palsies of the same muscles. These have hitherto been published only in a limited number. They have never, so far as I know, been demonstrated as a result of affections of the cerebral hemispheres. In all cases where autopsies have been made, either a general affection of the central system or humors affecting the parts through which fibres from the hemispheres run, collected on a little space, have been proved as a cause. Bilateral palsies of the side-turners are generally, when acquired, also complicated with palsies of other turners, either at the same time or in succession.

AFFECTIONS OF THE MUSCLES MOVING THE EYES PARALLEL.

CASE 1: *Paresis of the side-turners and the up-turners.*—P. Lofsberg, aged thirty, Zaalsberg. The patient consulted me April 26, 1888, complaining of weak sight. The movements of the eyes appeared to be very restricted sideways and inward.

[1] If we would adopt the words: right and left side-turners, up-and-down turners, out-and-in turners, special names (such as pleuroplegia for the palsy of the side-turners) would be superfluous. The denominations hitherto used do not properly express the pathogenesis of these palsies.

When both eyes are left open, corneal margin cannot be moved farther than 4 or 5 *mm* from the outer canthus. When one eye is covered the excursion of the other eye is a little larger. Upward he cannot bring the globes farther than that the lower margin of the cornea stands 1 to 2 *mm* from the lower palpebral margin. Most excursive are the movements downward. V r. eye $\frac{4}{30}$, left $\frac{4}{12}$; C blue-yellow $\frac{1}{3}$, red $\frac{1}{3}$, and green $\frac{1}{6}$ right eye; left, pretty nearly normal. Fields of vision restricted outwards. Ophthalmoscopically nothing abnormal.

Five to six years ago the patient was troubled with dizziness, especially when walking in sunshine. At the same time he had double vision. Denied syphilis, but admitted to have had gonorrhœa. The patient was seen once only, wherefore the examination was not completed.

Probably in this case there has been once an affection also of one of the turners moving the eyes in non-parallel direction.

CASE 2: *Paresis of the side-turners, up-turners, and the levatores palpebr.* — Oscar Gustavsen, thirty-nine years, Korsgaden 20, Christiania, called on me April 11, 1890. Some fifteen years previously he had been under treatment for weak sight. Five or six days ago he noticed that he was unable to look up when he had walked about in the street for some hours. When seen, both palpebræ superiores drooped, covering more than half of the corneæ. When the lids were kept up by the observer, the globes were seen to maintain a slight deviation downwards. When he tried to look up, the eyes were set in oscillating movements. They could not be raised over the horizontal plane. The lateral movements were also very imperfect, and were made in an unsteady manner. He was able to bring both eyes some degrees beyond the median plane, but they soon glided back into their position in rest. Convergence was done perfectly. V. $\frac{1}{10}$ both eyes. C. can perceive hues of colored glasses. Ophth., atrophia nerv. optic.

There was some swelling about the ankles. In the urine some albumen. Patellar jerk absent. Syphilis denied. A month later he had regained his power over the levatores palp. and over the up-turners. The paresis of the side-

turners was unaltered. His wife stated that his mental power was decreasing; memory mostly gone.

I saw the patient some weeks ago. He was then much in the same condition.

Of interest in these two cases is the decrease of sight, which has been repeatedly observed in cases of paresis of one or more turners. In No. 2 the paralysis of the levatores palp. is remarkable, as this, in cases where the affection is acquired, but seldom coincides with the palsy of the up-turner.[1] May be that such is the *rôle* in congenital cases. Of such I know only the case related below; but, to judge from the note, referred to in Noyes'[2] handbook, analogous cases have been observed.

CASE 3: *Congenital paralyses of the up-turners and the levatores palpb.*—Gunda Tollepsen, aged twenty, Spydeberg, called on me, because she wanted to have her eyes operated on. She states that she was born with both lids hanging down, and that she never had been able to look upwards. There is complete paralysis of the up-turners and levat. palpb. In order to enlarge her visual field, she holds her head backward. This, together with the downward direction of the look, gives to the patient a very peculiar appearance. The skin covering the upper lids feels a little stiff. Attempts to raise the lids result in contraction of the frontalis only. When the lids are raised by the fingers, and the patient is requested to look upward, she makes excessive convergent movements. The position of the globe in rest is also convergent. Binocular vision not present. Double vision can be called forth, at least, by using luminous objects. The crossed images stand *vertical* and at the same height. V (rainy day) $\frac{1}{4}$, right; left, $\frac{1}{3}$; C normal. Emmetropic. Ophthalmoscope, nothing abnormal. Other malformations not present. No consanguinity between the parents. I saw her but once; she promised to call again, but did not re-appear.

[1] I do not remember to have seen related more than one case in which such was the fact, namely No. iv., by Priestley Smith, *Lond. Ophth. Hosp. Rep.*, ix., p. 25.

[2] *L. c.*, p. 149. "Defect in the levatores palpebrarum and in both superior recti (?) of congenital type must be referred to nuclei. If it should prove correct that in congenital cases the palsy of the levatores were combined with that of the upturners, we would have an analogon to the palsy of the eye-branch of facial in congenital palsy of the side-turners." (Alf. Graefe, Chisolm, Möbius, and Schapringer). It points to an intimate topographical relation between the origin of the nerves in question. In congenital monolateral affections the paresis of levator and the up-turner is often found combined.

From the literature I know about ten cases of paralysis of the up-turners. Beyond these I know two more lately observed by Prof. Hjort of this town, making in all fourteen cases. One of Hjort's patients was somewhat imbecile and had morbus Basedowi. The upper lid was in this case raised to the utmost, and the eye kept directed downward.

The paralysis of the down-turners seems to be very rare. Setting aside the cases of complete ophthalmoplegia, I know only two cases, published by Parinaud and Hulke.[1] In both it occurred together with palsy of the up-turners. Parinaud states that Priestley Smith has seen another case, and refers to *Lond. Ophth. Hosp. Rep.*, 1879, but here is spoken of a patient suffering from palsy of the left-side turner. There is another case, which is much quoted, that of Wernicke,[2] in which the up- and down-turners are said to have been almost completely paralyzed,[3] but from the discussion which followed on Wernicke's communication, it appears doubtful whether or not his case is to be considered a paralysis of the down-turners. Possibly some cases are related under the diagnosis, "cramp of the recti superiores." A differential diagnosis between tonic cramp and paralysis of the antagonist may sometimes be impossible. A case, in which the patient during several weeks was unable to look down, is reported by P. Winge, chief physician of the lunatic asylum in this town.[4] It occurred in a man, twenty-nine years old, who had been a criminal and lived a dissipated life. His father and sister had been insane. The patient had a fit two months before he came to the asylum, and had since been maniacal. When seen his eyes remained steady in an upturned position, so that only a small segment of the cornea was visible. As he gradually became better, the eyes returned to their natural position, but were again turned upwards when he, after some days, got a relapse of his mania.

[1] *Lond. Ophth. Hosp. Rep.*, 1881.
[2] *Berlin. klinisch. Wochensch.*, 1876, No. 27.
[3] In *Traité complet d'Ophthalm.*, Landolt and Eperon, p. 803. This case of Wernicke has become two cases with "l'abolition complète des mouvements verticaux."
[4] *Norsk. Magazin for Lægevidenskaben*, 1857.

AFFECTIONS OF THE MUSCLES MOVING THE EYES NOT PARALLEL.

CASE 4: *Paralysis of the out-turner and paresis of the side-turners.*—A. Solberg, painter, aged forty-eight, Königsberg, called on me December 11, 1890. He stated that he, seven or eight years ago, was troubled with dizziness and vomiting. With this exception he was always in good health. Some weeks ago he was seized with influenza, and, since that time, he has had some asthenopia, which is occasioned by a slight conjunctival affection.

On examining his eyes I found that he was quite *unable to make convergent movements.* Also the movements in side-directions were not of normal extent, and were accompanied by jerking movements when the globes were brought somewhat far out. Double images cannot be perceived by the patient. V right eye, $\frac{1}{1}$; left, $\frac{1}{3}$. Ophthalmoscopically, nothing abnormal. The patient believed that he never had been able to move his eyes inward. I saw him six months afterwards. The condition of his eyes was then unaltered.

Besides this case, I have seen two others with incomplete paralysis of the in-turners. In both, impulses to convergence produced nystagmus-like movements. In one of the patients both side-turners acted incompletely and binocular vision was lost. In the other the movements were impaired by looking to the right and downward, by which the nystagmus became very strong.

CASE 5: *Paralysis of the out-turners with paresis of the side-turners.* Jacob Nielsen, farmer's son, aged twenty-six years, Blakjer, was sent to me by Dr. Asker, May 20, 1891. As a baby the patient suffered from fits. One month before seen, he had herpes zoster on the left side of the breast, otherwise he has always been in good health. The sight has been good until six days ago, when it began to fail in the left eye, a cloud gradually coming before it from inwards and below. Left eye in convergence. Whether this has been so always or not he cannot tell. Mobility free upward and downward, but seems to be restricted sideways. The defect in mobility to the left side is greater than to the right. V right eye $\frac{1}{1}$; left amaurosis. Both eyes hypermetropic, 1 D.

Ophthalmoscopically a little hyperæmia of the left disk; right, nothing abnormal. Tension normal both sides. No pain from pressing the left globe backwards. Left pupil does not react to light of any intensity. By convergence good reaction. Ordered potassii iodidum. 23d, patient able to see shadows of the fingers moving before the eye. After that time sight rapidly improved. 27th, Snellen No. 18, 50 *cm;* through colored glasses he can perceive blue. Ophthalmoscop., nothing abnormal. 2d of June, V $\frac{4}{5}$; C blue $\frac{1}{3}$, yellow $\frac{1}{3}$, red and green $\frac{1}{14}$; the last colors[1] sometimes called gray; no constriction of the field of vision. The condition remained the same during a week. The patient then returned home. When seen again 28th of November, V and C on the left eye normal. The position of the eye still in convergence. When objects were brought far out in sidewise direction, the patient used the opposite eye for fixation. When alternately one eye was covered, the position of the screened eye was alike. The defect in mobility to the left still larger than to the right. The distance between the external corneal margin and canthus externus being on this side at least 2 *mm;* when the right eye is covered on the right side under the same circumstances, no more than 1 *mm.* Double images could be brought to perception when one eye was armed with a colored (blue-green) glass and a lighted candle used as an object, but they were always indistinct. The distance between the homonymous images amounted to 3° in sidewise directions. They were standing at the same height and the distance remained the same for *every direction of the look.*[2]

As seen the case is rather a complicated one. The symptoms from the side of the muscles would certainly by many be explained as a double-sided paresis, but if so we should expect the distance of the double images would have been increased, when the object was brought to the left, as on this side the external muscle was the weaker.

[1] Physiological green and red on my chromatometrical tables.

[2] The instrument used in such examinations is a phorometer of my own construction. It consists of a rod in which are 5 holes, 4 of which are covered with prisms and one with a plane-glass. The uppermost prism, angle 10°, has its base turned down; the others, angles respectively 10°, 16°, and 20°, to the right side of the patient. The rod can be drawn up and down in order to bring any glass before the eye of the patient. On each side of the rod are two rotating disks with 8 holes in each. Seven of the holes are covered with prisms of respectively 2°, 4°, 6°, 8°, 10°, 12°, and 14° angle. On the right side the

In the congenital and acquired cases of palsy of the different muscles we have a chain of symptoms, which can be explained only by assuming an affection of central paths through which the impulses are led to sets of muscles acting synergetically. This explanation is, however, far from being commonly adopted. Many authors still assert that the causes for these affections are to be sought in affections of single nerves or nerve branches or in such of the nuclei. It is however not difficult to prove that such affections cannot produce the palsies in question. If we take, for instance, a case of congenital paralysis of the side-turners, and try to explain this as a palsy of both abducentes,—such as one of the first authorities on this topic, Prof. Alfred Graefe, has done,—the difficulty to understand why the recti interni should not be able to act by associated movements at once presents itself.

In congenital cases we could assume a nuclear affection. The defect in the nuclei, being intercalary ganglia, had, however, to be explained as secondary, depending on a defect of the cerebral centres. In acquired cases a nuclear affection can be excluded, almost with certainty, as it would be very improbable to suppose that exactly the corresponding points of the nuclei on both sides could be affected and the rest remain sound.

The etiology of these palsies can only be explained in a satisfactory manner by supposing that the centres for the muscles acting synergetically, and the fibres from the centre, lie in a close local relation.

That impulses to synergetic movements are transmitted through separate fibres within the cerebrum must consequently be inferred both from the character of the physio-

prisms have their bases turned to the centre of the disk; on the left to the periphery. The rod and the disks are put up in a frame, standing at a right angle to a small table. The table is well fixed, and by screws brought to a horizontal position. In the frame are three holes, one in the middle corresponding to the holes in the rod, and one on each side of this, corresponding to the holes in the rotating disks. Consequently adducting or abducting prisms up to 34° (20° + 16°) can be brought before the eyes of the patient. When the power of adduction is to be tested, the patient places his left eye before the intermediate opening in the frame; if abduction is to be tested, his right eye before the same opening. The instrument is in a way a combination of that invented by Dr. Stevens and that invented by Dr. Schiötz.

logical movements and from the above described palsies caused by affections beyond the nuclei. That the fibres through which impulses to movements—whether volitional or reflected—are conducted, are almost fully developed by the time of birth, must be concluded from the fact that children being few days old move their eyes symmetrically.

The trophic (cortical) centres of these fibres must, as stated before, be supposed to be on the opposite side. That such is the case we must conclude from the existence of total monocular palsy of all external muscles. This is, however, not easy to explain in accordance with the fact that cortical affections of one side only are capable of bringing both eyes in a sideways direction.

The existence of separate centres for volitional movements on each side should enable us to move each eye separately, just as we can move each hand separately. This is true to a certain degree. We can, especially when under the influence of visual impressions, in order to preserve binocular sight, make rather excursive movements to which we in daily life are quite unaccustomed. Such movements require always, especially when made in vertical directions, a strong exertion of the will. Also, such movements may be done, quite independently of visual impressions, as far as I know, only in a horizontal plane. A young man of my acquaintance has the power of moving each eye independently of the other, having first brought both in strong adduction. Keeping, so to say, one eye bound in this position, he lets the other wander with unsteady movements and rather slowly from one canthus to the other. During this he perceives double images in corresponding directions. V in case $\frac{1}{4}$, each eye, and binocular vision present. If independent movements were of any benefit to us, we should perhaps speedily acquire the power of making them. Most movements are, however, done by reflexes called forth by visual impressions. How great their influence is may be concluded from the fact that we involuntarily never make dissociated movements except in sleep and under narcosis.

ANOTHER CASE OF SYNCHRONOUS MOVEMENTS OF THE UPPER LID AND LOWER JAW.

By Dr. O. BULL, Christiania, Norway.

IN these ARCHIVES, vol. xvii., I published an article on this subject. Since then other cases have been reported by Fränkel, Reuss, Bernhardt, and Schapringer. The explanation still generally accepted is that given by Gowers, according to which the levator palp. should in such cases receive fibres from the nuclei of the fifth or seventh pair. That this hypothesis is not plausible I desired to show by publishing the case above referred to. Shortly afterward I had occasion to see the following, in most respects, quite analogous case.

Gunnerius Hansen, sixteen years old, examined July 11, 1888. The patient states that he was born with the left lid hanging down. He wanted to have it raised by operation.

The lid covers three quarters of the cornea. It remains motionless during all movements of the globes, when both eyes are open. On opening the mouth, in speaking and in mastication, it is raised, wherefore the patient, in order to conceal as much as possible the disfiguring appearance caused by the drooping lid, generally keeps his jaws apart. Involuntarily the lid is also raised by keeping the mouth shut and bending the head backwards. Voluntarily he can raise his lid when the other eye is covered, and he can do so to the same extent as when he keeps his mouth widely open, viz., so much that the upper margin of the cornea becomes visible. By putting the orbicularis into action he is able to check the involuntary movements.

Rectus superior on the left side paretic. V normal, both eyes. Ophthalmoscopically nothing abnormal. Double vision present when the left lid is raised.

We have in this case raising of the lid (not of the eye) when the patient opens his mouth as well as when he bends his head backwards; consequently, not only active contractions of the digaster but also passive extension of the said muscle produce involuntary contractions of the levator. Further, the elevator can be voluntarily contracted independently of any action of the muscle innervated by the fifth and seventh pairs, when the right eye is covered and the patient asked to contract his paretic rectus superior. How these facts can be explained by an hypothesis of an abnormal origin of the nerve going to the levator, I am unable to understand. Bearing in mind that the elevation of the lids is often made involuntary by gaping, and still more by turning the head upwards, it seems more plausible to explain the voluntary contractions of the elevator in this and in analogous cases, as associated or as reflex movements. In cases where the raising of the lid is induced by muscular contractions only, an assumption of an irradiation from the motor centres of the muscles in question to that of the elevator may be a more plausible explanation. That anyhow a hypothesis of an abnormal innervation (which must be considered congenital) should be applied to all such cases, we must reject, judging only from the case of Fränkel. Here the drooping of the lid comes on after a lapse of several years, the raising of the lid by chewing having meanwhile become less,

THE REMOVAL OF A TUMOR OF THE OPTIC NERVE WITH PRESERVATION OF THE EYE.

By the late Dr. GEO. S. NORTON,

Reported by A. B. Norton, M.D., New York.

(*With one wood-cut.*)

As only a few instances of the successful removal of tumors of the optic nerve with preservation of the eye have been reported, the following case with successful operation, as made by Dr. Norton, is deemed worthy of record. This report is taken from his case records precisely as it there appears.

Miss J., aged thirty, was first seen on September 25, 1890, at which time she gave the following history: The right eye began to protrude ten or twelve years ago and has steadily increased ever since. For five years she had much sharp pain in the orbit, extending to the back of the head and down to the stomach. Examination showed O D V = $\frac{1}{200}$, O S V = $\frac{15}{15}$. There is a protrusion of the right eye directly outwards of twenty-two millimetres, which, she says, varies at different times, being greater on some days than others, and greater during menstruation, and that the vision seems to be better when the eye is small.

The ophthalmoscope shows the retinal vessels contracted and the optic nerve atrophic. The movements of the eye were as good as could be expected from the amount of the protrusion. The patient was very nervous and would not allow of deep pressure to determine the nature of the growth.

Oct. 7th.—Eyeball protrudes directly forward, so that the

posterior portion of the globe is just even with the outer border of the orbit. No pulsation could be detected. Patient extremely nervous; had a fainting spell with retching before being put on the table for operation, but recovered after taking some whiskey. Ether was given and well borne throughout the operation until just at the end, after the tumor had been removed, when the pulse became so much weakened that a hypodermic injection of brandy was made. Palpation after she was under ether showed a soft elastic tumor behind the eyeball and connected with it. An aspirating needle inserted at the outer canthus drew out a drop or two of serum.

An incision was then made between the superior and internal recti muscles of sufficient size to permit of the finger being passed down to the tumor. Using the finger as a guide, the tissues around the tumor were severed back to the optic foramen. The nerve was then divided at the optic foramen and afterwards severed close to the eyeball. Tumor at once appeared at the opening and was removed.

By rotating the eye the cut end of the nerve could be seen, which appeared clear and white. The socket was washed out with a 1 to 4,000 solution of the bichloride of mercury, the eyeball replaced and covered with the lid. There was but moderate hemorrhage throughout, yet some infiltration of blood underneath the conjunctiva and into the lids, so that the protrusion appeared about the same as before the operation. A compress bandage was applied and the ice-bag used locally. The day following the operation the temperature was 99½° and pulse 102.

Oct. 21*st.*—The ice was used three or four days. Patient has had no pain at any time. The eyeball protruded greatly for some days, from the infiltration of blood into the orbit and into the lids around, extending even to the other eye. There was quite extensive chemosis below, so that the conjunctiva protruded between the lids. Upper lid greatly swollen, but covered the eyeball; this swelling gradually subsided, so that about the sixth or seventh day the lid retracted, leaving the eyeball exposed, and the cornea became hazy. The eyelid was drawn over the globe and held in place by adhesive strips, which were kept on for four or five days. To-day there is still considerable haziness of the cornea, but has diminished greatly. The eye has sunken back into the orbit, nearly as much as the other eye.

The eye, however, is nearly immovable, especially outward and inward, and stands somewhat outward. The conjunctiva still protrudes between the lids, but is diminishing, and with but slight discharge. No pain or other unpleasant sensations.

Nov. 20th.—Still some swelling at the inner canthus and moderate discharge. Cornea a little hazy below, but clearing. Much better movements of the eye.

Dec. 18th.—Optic disc very white, but from its centre are seen two small vessels running upward for about the distance of the diameter of the optic disc. There are also seen slight choroidal changes. Much less redness of the eye and movements much better.

This was about the last time the patient was seen by my brother, but in order to make the record more complete I requested her to call at my office, which she did on May 3, 1892, about eighteen months after the operation, when I found little if any perceptible protrusion of one eye over the other. The movements of the eye are a trifle limited in all directions, but the eye stands perfectly straight. An oblique illumination of the cornea shows a very slight opacity. The pupil is slightly dilated, but not as much so as one year ago. In fact, the general external appearance of the eye is not noticeably different from the other, and the operated eye could only be told by a close examination. The ophthalmoscope shows the optic papilla of an extremely white glistening appearance, with a faint line showing the position of the central vessels; at the upper part of the papilla there appears a leash of small vessels. There are some choroidal changes a short distance from the disc, and in the lower part of the field there appear to be two good-sized retinal vessels. The fundus in all other respects appears normal.

In the special effort to save the tumor for microscopical examination a fresh solution of Müller's fluid was procured from a presumably reliable pharmacist, but, unfortunately, it was not properly prepared, so that instead of hardening the tumor it entirely disintegrated and destroyed it within a few days. Judging, however, from the macroscopical appearance of the tumor, it was a myxoma.

The accompanying illustration was made immediately after the removal of the tumor, and is its exact size and shape. The covering of the tumor seemed to be formed by the dilated sheath of the nerve. The structure of the tumor

seemed to be of a gelatinous substance held together by a cellular network; the nerve fibres, apparently passing directly through the centre of the tumor, and after removal of the tumor appeared as though they had retracted into the substance of the growth.

UNUSUAL FAMILY HISTORY IN TWO CASES OF GLAUCOMA.

By W. B. PUSEY, M.D., Louisville, Ky.

THE following cases are of sufficient interest, I think, to justify a report. Although the cases in themselves do not differ from numerous others of a similar character, the family history given is very unusual. I have seen in any of the reference books no mention of heredity in glaucoma, yet both cases here reported present indisputable evidence of such an influence at work in its causation.[1]

Case 1. John C., aged seventeen years, white, vigorous, well-developed, and intelligent, describing concisely his trouble and great family misfortune. Seven months before presenting himself for examination had had a severe attack of *neuralgia*, involving the left eye, then a few hours later the right, and occasionally for about thirty-six hours in each. The pain was intense, and vision greatly blurred. The usual rainbow shades around a flame were very noticeable. After the subsidence of this attack the vision improved. In about four weeks he had another, and in a short while still another attack, with steady and final complete loss of vision. I now find the eyes in about the same condition: marble hard, painful; pupils dilated; chamber shallow; vitreous hazy; sclera thinned; and vision in right eye equal to faint, uncertain perception of light centrally. In the left it is zero. Instillations of eserine sulph. accomplished nothing; nor did the iridectomy, which was done with only the faintest hope of any resulting good, afford any relief. It was simply a typical

[1] Hereditary disposition to glaucoma is not very rare, but seldom is it so pronounced as in Dr. Pusey's cases.—H. K.

case of too long-neglected glaucoma which is so frequently met with. The onset of the disease in its acute form is so sudden, and its distressing agonies and effects so easily accounted for by the mere suggestion of neuralgia, that medical advice and attention are frequently not sought until the damage is irreparable.

The following is the *family history:* His mother, his mother's uncle, his mother's brother, his sister, his brother, and himself were all blinded by *neuralgia.* His mother and his uncle saw the vari-colored lights around a flame, and he tells of their staring eyes at a later stage. His brother was released from the regular army because of his blindness, due to the same cause, and his sister was operated upon, when fifteen years old, for glaucoma, by Dr. Cheatham; the record of her last visit showing nearly perfect vision. This patient I have seen, and he talks of the others in such a manner as to leave little doubt as to what their trouble was.

Case 2. I saw in the practice of Dr. Cheatham, and, by his permission, I report it with the preceding.

Will G., age thirteen and a half years. Sight failing gradually for eight months. Pain in head and about eyes. Vision $\frac{8}{200}$ in each, and no improvement with glasses. Visual field contracted, T +. Optic nerve excavation, and arterial pulsation.

His family history is as follows: His father, his father's mother, a brother, and a sister are all blind from glaucoma.

That all these people in the two families should suffer from the comparatively rare affection, glaucoma, is rather too remarkable to be a coincidence, and that in each family there are several persons of the age which is generally accredited with only about 1 per cent. of all cases of glaucoma, is also remarkable.

ATTEMPT TO REMOVE A CHIP OF STEEL FROM THE BACKGROUND OF THE EYE UNSUCCESSFUL THROUGH AN ACCIDENT WHICH MIGHT HAVE BEEN AVOIDED.

By H. KNAPP.

FAILURES being as instructive as successes, mostly even more so, I beg to relate the brief history of the following case.

Mr. Feigenbaum, aged forty, presented himself at the N. Y. Ophthalmic and Aural Institute, September 28, 1891, with a simple plastic iritis of the right eye, for which he received atropine instillations. December 8, 1891, he complained of not seeing quite well with that eye, though all pain and redness had disappeared. On examination with the ophthalmoscope, I found the media normal, but on the inner upper part of the fundus a black, elongated substance, which I at once declared to be a piece of iron. It touched the margin of the optic disc, lay in the retina, projected into the clear vitreous, measured $\frac{1}{3}$ P D in breadth and 3 P D in length. It was surrounded by a white seam, which extended twice as much upward and inward toward the equator. It was the thickened edge of a rupture of the retina which held the foreign body tight, and, beyond it, marked the limits of a perforation of the retina through which the normal choroid could be seen lying bare. On questioning the patient it was ascertained that five months previously a piece of iron struck his right eye while he was hammering a chisel to open a case. The eye was inflamed for two months, and the sight was poor but gradually improved. When I examined him it was $\frac{20}{30}$, and a triangular defect in the visual field upward and inward, with

its apex about 15° from the point of fixation, was made out. No trace of the entrance of the supposed foreign body could be detected. The retina in the vicinity of the foreign body and the perforation was slightly hazy, the optic disc somewhat redder than usual, and beset with a few small hemorrhages. The tension was normal ; no irritation in either eye.

The patient was told that a chip of iron was in the depth of his eye, for which nothing need be done as long as it remained quiet. He was asked to come every week or two to have the eye examined. The eye kept free from irritation until the beginning of April, 1892. Then the sight became impaired from streaks of detached retina, which increased from week to week. At the end of April it was $\frac{20}{200}$, and the field greatly contracted in its inner and upper side.

I advised the patient to let me try to save his eye by drawing the foreign body out, but to allow me to remove his eye if I failed in the attempt. He consented.

OPERATION.—Under cocaine I laid bare the tendon of the internal rectus, placed a suture through its upper edge and the upper part of the episclera near the corneal margin, and another suture in like manner through the lower edge of the tendon ; left both threads untied, laying them up, respectively down, so as to draw the muscle forward again at the end of the operation. I detached the tendon from its insertion and dissected it, the muscle, and the adjacent episcleral tissue clear off as far as the entrance of the optic nerve into the sclerotic. The posterior half of the ball was then drawn forward by means of a sharp double hook, a small squint-hook passed around the optic nerve, and the sclera incised with a Beers knife in the horizontal meridian from the optic nerve, slightly nasally and upward, about 4‴ in length. A drop of vitreous presented. Now I wanted to draw the foreign body into the wound with an electro-magnet, seize it with forceps, and cut it out of its connections. The magnet, which had been found in good order before the operation, did not work, and by examining the wires and their connection, shaking the battery, etc., I could not find out where the current was broken. Not being able to use the magnet, I tried to extract the supposed foreign body with forceps, but brought out only vitreous and shreds of soft pigmented tissue. Not succeeding in taking hold of the foreign body, and thinking that further attempts, even if successful, would destroy the eye anyhow, and possibly en-

danger the other by sympathetic inflammation, I enucleated the eye at once, relieving the pain by instilling cocaine. The patient did not complain much of pain, and made a good recovery.

As soon as his eye was bandaged, I opened the enucleated globe by an equatorial section, and found that a black metallic body, 1 *mm* by 3 *mm* in size, lay close by the incision which I had made into the sclerotic. It was attracted and raised with the surrounding tissue by the electro-magnet, which now worked well again. The commutator had been moved inadvertently, which caused the interruption of the current, but had not been noticed during the operation.

The experience gained from this case shows that the plan of the operation was judicious and the execution correct. The result in all probability would have been satisfactory had the disturbance of the battery not occurred, or been detected during the operation. The method of the operation is the same according to which tumors of the optic nerve have been removed, with preservation of the eyeball, the sheath of the optic nerve incised, and cysticerci extracted from the posterior part of the retina. That it may successfully be applied to the removal of foreign bodies from the posterior segment of the globe seems proven by the above case.

A CASE OF REFLEX MICROPSIA UPON POSTERIOR HYPERTROPHY OF THE INFERIOR TURBINATES.

By JOHN DUNN, M.D., Richmond, Va.

Miss W——, aged eighteen, complained of frequent headaches; of pain about and especially behind the balls of her eyes; of inability to use her eyes any length of time continuously, because use of them caused them to pain, and, especially, because the letters in the part of the page at which she would be looking would get smaller and smaller, and, finally, become too small to read. It is not that the size of the book, or of the page, seems to diminish, but only the letters and the words for about two inches around the word upon which her eyes are focussed for the time, and this diminution in the size of the words "follows" her "eyes all over the page," while the words outside of this area do not seem to be decreased in size. This diminution in the size of the letters is not constantly present when she is reading, but occurs frequently enough to make reading with any comfort impossible. I showed Miss W—— Saeger's test types. "The letters of an ordinary book became as small as those of No. 1," she says. This trouble has existed for about a year. When in the open air Miss W—— has never noticed that any of the objects around her were smaller than she knew them to be; but, frequently, when she would look through a window-pane at objects on the street, they would appear much diminished in size. Has never seen double. No inflammation of the eyes. Fields of vision normal. Miss W—— has never been very strong, and one of her sisters has died of consumption.

Under atropia, refraction for O D and O S was found to be the same + ¼ D, sph. c. + ½ D, cyl. ax. 90°. Exophoria ½° for

distance. Hyperphoria, possibly, $\frac{1}{4}°$ to $\frac{1}{2}°$, although this is uncertain. Although it seemed little likely that the refractive condition of the eyes was the cause of the trouble, glasses correcting the astigmatism were ordered tentatively. Miss W—— was not seen again for about three months, and then to report that the trouble with her eyes was no better. Examination of the nose was then made. Anteriorly, the middle and inferior turbinate were normal, showing no sign of hypertrophy. Posteriorly the inferior turbinates were found to be immensely hypertrophied, so as to fill up the space between them and the septum. This hypertrophy extended forward for the posterior one third of the inferior turbinates, and except at the posterior ends was chiefly along the lower border of the turbinates. There was considerable mucous secretion from the hypertrophied membrane, so that the inferior air passages of the nose were entirely closed for a distance corresponding to the hypertrophy of the turbinate. The upper air passages were open, so that the nasal obstruction was noticeable to patient chiefly during expiration. The mucous secretion, of course, gave sensation of constant cold in the head. The posterior ends of both inferior turbinates were removed, and patient was given syr. ferri. iod. Since the removal of the hypertrophied turbinates, now more than three months ago, Miss W—— had not been annoyed by the diminution in size of the words while reading.

The micropsia in this case was the result of temporary ciliary paresis; the increased ciliary efforts necessary for accommodation causing a misinterpretation by the brain of the size of the letters. While the general health and, perhaps, the neurotic tendency of the patient prepared the nervous system for the expression of a neurosis, it is highly probable that in the area irritated by the hypertrophied turbinates is to be sought the origin of the nerve waves whose reflex expression was temporary ciliary paresis; the strength of the probability consisting in the fact that treatment directed to the hypertrophied turbinates was followed by disappearance of the ciliary paresis.

A VALUABLE EXPERIMENT BEARING UPON SYMPATHETIC OPHTHALMIA WITH A CRITICAL REVIEW OF THE SUBJECT.

By ROBERT L. RANDOLPH, M.D.,

ASSISTANT OPHTHALMIC AND AURAL SURGEON TO THE JOHNS HOPKINS HOSPITAL AND TO THE PRESBYTERIAN EYE AND EAR HOSPITAL, BALTIMORE; OPHTHALMOLOGIST TO THE BALTIMORE AND OHIO RAILROAD.

IT is seldom that we meet a case where all the conditions are favorable for thoroughly testing the truth of the infectious origin of sympathetic ophthalmia, and I am satisfied that the case here reported, together with the laboratory experiment, form a valuable supplement to my earlier work on this subject.

The following typical case of sympathetic ophthalmia came to the Presbyterian Eye and Ear Hospital early last summer.

J. M., forty-one years old, farmer; while endeavoring to dig out a large stone deeply imbedded in the earth, a piece of the pick broke off and flew into his right eye. This was on June 1, 1891. He kept on, however, with his work though seeing very indistinctly with the wounded eye. He was not conscious of any pain at the time. He continued regularly at his farming for three days longer, when pain and dimness of sight compelled him to rest. He came to the hospital on the fifth day. At this time he had only light-perception left in the wounded eye. The eye was exceedingly sensitive to the touch. He remained in the hospital three days, and left with directions what treatment to follow, and with the understanding that he should return in case the pain persisted. After he had been at home six weeks, and suffering all the time, his good eye began to show signs of sympathy,

photophobia, lachrymation, and dimness of vision, and according to his account he could not see a horse a hundred yards away. Before this he possessed unusally acute vision. His family physician treated him with blisters and cold applications to eye, and sight improved. Thursday, August 13th, he came to the hospital again, and the condition of his eyes was as follows:

In the injured eye light-perception was gone. Eyeball very sensitive to touch. At the point of the wound, the sclera was injected, cornea clear, pupillary margin entirely bound down by adhesions to anterior capsule. His good eye had a vision of $\frac{1}{3}\frac{1}{0}\frac{1}{0}$. The anterior capsule showed abundant inflammatory deposits upon its surface, together with numerous evidences of old iritis all around the pupillary margin. Indeed, it was difficult to make out the fundus with any distinctness on account of the general dirty appearance of the lens. He complained of great pain in forehead and in the region behind the nose. He was persuaded to have the eye enucleated, and I prepared to have everything ready to make cultures from the vitreous and anterior chamber.

The eye was removed, and after sterilizing with a hot knife a point at the corneo-scleral junction not far from the wound, I entered the anterior chamber with a spade-knife, which had been sterilized by passing it several times through an alcohol flame. I withdrew the knife and followed it with a platinum wire loop, which was stirred up in the anterior and posterior chambers of the eye, and *smear* cultures on agar were made, also three Esmarch tubes.

These tubes were subjected to the proper temperature in an oven for as long as ten days, and not a sign of growth showed itself. Prof. Welch, Dr. Flexner, and myself each examined cover-slips made from the vitreous and anterior chamber, but discovered no organisms.

I then obtained a rabbit, and made a small opening into the anterior chamber with an iridectomy knife. I may add that all the instruments were thoroughly sterilized. An iris-forceps was introduced into the anterior chamber of the enucleated eye, and a regular iridectomy was performed. I found the iris very hard to pull away from its adhesions to the lens capsule, but managed to draw out and cut off a good-sized piece of the iris. This latter was then forced into the anterior chamber of the rabbit's eye, and moved about several times in the chamber, and partly drawn out and left.

In one week's time, with the exception of a slight blush about

the wound, the rabbit's eye showed no evidence of disease, and in two weeks this injection had faded entirely away, and only a slight prolapse of the iris at this point gave any evidence of the operation. The cornea remained clear throughout, and the prolapsed iris was simply the result of the manipulation, and in no way interfered with the functions of the eye,—just what we sometimes see in cataract-operation without iridectomy. During the operation I took pains to bruise the tissues about the incision, thus imitating, as far as possible, the conditions peculiar to a penetrating wound of the eye.

One cannot read the literature of this subject for a single year without being struck by the want of certainty that exists as to its exact nature, and I mean that this has been the case every year even since Deutschmann's experiments. The solution proposed by Deutschmann and the history of his experiments are praiseworthy, and few scientific articles may be read with more interest by all medical men than his contribution to the pathogenesis of sympathetic ophthalmia. Let me review briefly his experiments.

The earlier experiments of Deutschmann were made with the spores of the aspergillus fumigatus, and consisted in making repeated injections of a suspension of this organism into the corpus vitreum of a rabbit. Choroido-iritis followed the first injection, and at the end of four weeks, or a few days after the fourth injection, he discovers choroido-iritis and opacities in the vitreous of the fellow-eye. The animal is killed, and the microscopic examination confirms the diagnosis. Evidences of inflammation are seen throughout the inoculated eye. Interstitial inflammation of the optic nerve extending up to the chiasm, with an involvement of the latter, is seen, the process passing on down to the other eye by way of its optic nerve. The iris and ciliary region of the sympathetically affected eye were not examined. The posterior half of the eyeball shows abundant signs of inflammation in round-cell infiltration. He concluded therefore that a sympathetic inflammation may be produced in one eye by the introduction of infectious matter into the other eye, and that the track of this inflammation is along the optic nerve and its sheaths. Inasmuch, however, as he

regarded the inflammation resulting from the inoculation with the aspergillus fumigatus as the result of chemical irritation, and knowing that such irritation is rarely, if ever, concerned in the production of sympathetic ophthalmia, he resorted to the pus organism for the inoculating material. He injects two or three drops of a suspension of staphylococcus aureus into the vitreous of one eye. The animal dies of meningitis on the third day. To avoid this complication, he uses a very dilute suspension of the same organism and experiments on five rabbits. Only one of the animals gives a negative result, negative in so far that after remaining alive for several weeks no change was observed in the fellow eye.

Meningitis does not occur in any of these cases, but all the rabbits die of general infection at periods ranging from five or six days to three weeks. As regards the microscopic examination, round-cell infiltration with micrococci were to be found in both optic nerves and chiasm and in the posterior half of second eye; a typical case of sympathetic ophthalmia, he concludes, in all but one feature, namely, in the non-participation of the iris and ciliary region of the second eye. And the reason the iritis is absent is because the animal dies before the organisms have time to reach the anterior portion of the eye.

In reading the account of these experiments one is forcibly struck with their simplicity; and in these five experiments the result of each one never fails to confirm the result of the foregoing, so that after coming to the end of Deutschmann's work one feels that there is strong reason to believe that the theory is proven. I doubt whether any scientific problem in pathology has ever been proven so smoothly.

The nature of sympathetic ophthalmia has always been an interesting topic of discussion among ophthalmologists, and when Deutschmann's work appeared in 1882 it can be imagined with what satisfaction the account of his experiments was read and how generally they were accepted.

As is always the case in experimental pathology, any special solution of a problem is subjected to verifying tests at the hands of different observers. Such has been the fate of this class of work for years, and it is no uncommon thing to

find what seemed a valuable discovery fall into disrepute simply because it could not stand the test in the hands of others. And such a course is right, as any one can readily see. The explanation of any phenomenon in medicine only becomes valuable when that explanation can be verified by others than the originator. The things in the science of medicine which remain are those things which have been proven by many, both in the laboratory and in the hospital, and the things which have been discarded and are forgotten are those things which have been found worthless except possibly in the hands of one man.

Such striking and uniform results as those which attended the experiments of Deutschmann would seem to promise an easy confirmation, and it was almost with this conviction that I entered upon the experiments published in these ARCHIVES three years ago (vol. xvii., 187–213). The first parallel experiments of Deutschmann's work were made by Dr. H. Gifford,[1] of Omaha, who at the time he was engaged in this work was serving as one of Horner's assistants in Zürich. I shall not go into an account of his experiments in detail, but will simply state that after repeating Deutschmann's experiments on seventeen rabbits, he failed on any point to confirm the work of the latter. Eighteen months later I commenced my own work on this subject, and after spending many months in a series of thirty experiments I obtained nothing but negative evidence from Deutschmann's point of view.

For the first few months I used dogs as subjects, as I supposed they would be less likely to succumb to the effects of a general infection, and in consequence would enable me to follow out more accurately the theory, and my results proved that I was right, as none of the animals, with the exception of one case, showed any evidence of constitutional disturbance. Until this time the character of my work had differed in only one point from that of Deutschmann, namely, in the fact that mine were made on dogs. Thinking that this difference might impair the value of my work as a control of that of Deutschmann, I concluded to repeat his

[1] *Ibid.*, vol. xv., 281–295.

experiments on rabbits. This line of experiments consisted of fifteen in number, and they resulted just as did the first series; in other words, at no time during the life of the animal could any sympathetic disturbance be detected in the second eye, and though an ophthalmoscopic examination was made every day the fundus of the second eye never indicated the slightest departure from the normal, and I may add that the microscopic examination only served to strengthen this state of the case.

My work then, so far as verifying the results of Deutschmann's experiments, resulted negatively. As I remarked in my previous work on this subject, the microscope always showed infiltration of the intraocular end of the infected eye. A moment's glance was sufficient to tell me that. The excess of the nuclei present over what is seen in the normal condition was too apparent to be mistaken, but any noticeable progress of this increased nucleation for more than a short distance from the eye was never observed.

Mazza[1] experimented also upon rabbits and guinea-pigs, but reports only failures from Deutschmann's point of view. Nor did this observer notice any change in the second eye with the ophthalmoscope. In those animals that had died of meningitis cocci were to be found in the optic nerve and its sheaths.

And finally I would call attention to the work of Limbourg and Levy[2] of Strassburg. These experimenters inoculated twenty-five rabbits and seventeen guinea-pigs after the method of Deutschmann. As the changes in the inoculated eye resembled precisely those observed in my own experiments, I shall only allude to the condition of the second eye. To use their words "as regards any changes in the second eye which could be looked upon as sympathetic, none were observed with the exception of a very doubtful hyperæmia of the fundus. The examination for organisms was in every case negative." Their work simply confirms my own. It is surprising that the authors after finishing such a valuable piece of work did not feel themselves justified in

[1] *Bericht uber den VII. Internat. Ophthal. Congr.*, zu Heidelberg, 1888.
[2] *Archiv. f. experiment. Path. u. Pharmak.*, Bd. xxxviii., S. 153–166.

drawing any further conclusion than as follows: "It follows from these experiments how difficult a thing is the experimental investigation of this question."

It would seem that Limbourg and Levy were so influenced by Deutschmann's views as to distrust their own work, and yet their experiments were far more exhaustive than those of the latter. Even if they did not feel warranted in expressing in so many words their doubts as to the value of Deutschmann's work, they certainly had a right to conclude that it is impossible by the method employed to produce a sympathetic ophthalmia in a rabbit.

As regards the discovery of organisms in an eye which has been enucleated for fear of sympathetic disease in the other eye, experience differs widely, and even this point is too often decided in the negative to admit it as an additional support of the germ theory of the disease. Deutschmann rarely failed to find organisms in an eye enucleated to avoid sympathetic trouble, and though I have examined at least a score of such eyes I have succeeded in detecting organisms in but one case, and that was when the injury dated only two weeks back, a fact which has led me to conclude that the very questionable agency of micro-organisms in the production of sympathetic ophthalmia is rendered more unlikely when the sympathetic disturbance makes its appearance from two to six months after the injury.

Ohlmann[1] records recently having examined thirty eyes enucleated to avoid sympathetic disturbance, and in not a single one did he find organisms.

It should be remembered that sympathetic ophthalmia is a very rare disease. I can safely say that, in by far the majority of cases where I have performed enucleation, it has been on an eye which had been sightless for many months, certainly for many weeks and frequently for years, and this I feel sure has been the experience of most ophthalmic surgeons. In other words, enucleation is practised almost invariably as a precaution against the disease, and when we consider how all-pervading organisms are, is it not strange that, if they are really factors in this disease, they do

[1] *Archiv. f. Augen.*, Bd. xxii., 1.

not begin their work sooner, or is it not stranger still that in the majority of cases they accomplish nothing? When we consider the fact that organisms have almost certainly been introduced into all eyes which have been destroyed by penetrating wounds, and furthermore that a large number of such patients have carried these sightless eyes for a long time,—when we consider this, there remains a striking lack of anything like cause and effect between the opportunity offered the organisms to do their work and the actual occurrence of the disease. These remarks though are simply by the way, for I do not desire to pronounce myself positively against the infectious origin of the disease.

As to the experiments on rabbits, guinea-pigs, and dogs, the weight of evidence goes to show that not only is there no analogy between the disease, as seen in man and these animals, but that sympathetic ophthalmia cannot be produced in these animals through the agency of the staphylococcus, and that consequently such a character of experiments can throw no positive light on the subject.

It is unaccountable how Deutschmann discovered in every case such uniform conditions of neuritis extending along both optic nerves including the chiasm. Professor Deutschmann, no doubt, rejects the possibility of having mistaken the normal for the pathological condition, but I would again, as in my former work, emphasize the fact, that there is no question about the difficulty of differentiating unless one has at hand sections of a nerve which are known to be *normal*, and with which we can compare the supposed pathological section.

The rabbits, it will be remembered, all die at the end of two or three weeks, and in consequence the chief distinguishing feature of a neuritis at this stage is the increase in nuclear elements, and upon this point we must mainly rely in making our diagnosis. Changes in the *nervous* bundles are not readily demonstrable features of a neuritis of three weeks' duration. And though one will invariably detect an increased number of nuclei at the intraocular end of the infected eye, one will be astonished to find on comparing such a section with a normal eye what an enormous number of nuclei are present in the latter (physiological condition).

But, apart from this, in the light of all the control work that has been put upon this subject, and with nothing but negative results, it seems unreasonable to look upon the infection theory as demonstrated by the experiments of Deutschmann as anything yet awhile but an idea.

And finally, to return to my experiment in the laboratory. It seems to me that this is a most valuable test of the question as to what rôle bacteria play in the production of the disease. We have here an undoubted case of sympathetic ophthalmia, and if bacteria in the injured eye gave rise to the sympathetic trouble, it is reasonable to suppose that the means employed to discover them would have been successful, and that the experiment on the rabbit would at least have suggested something which might be regarded as positive evidence.

The reasonableness of the infectious origin of sympathetic ophthalmia no doubt accounts for the general acceptance of the theory, but we ought to recollect that this theory owes almost its entire support to a few experiments with the pus organism. And if there is an organism which we might almost predict would not produce the disease it is the pus organism. Purulent inflammation of the eyeball, in a word "panophthalmitis," where the pus organisms are most abundant, as a rule do not give rise to sympathetic ophthalmia.

As I have said before, I do not wish to be regarded as absolutely arrayed against the infection theory, but against the theory only so far as the pus organism is concerned. There are many organisms about which we know nothing, with which it might be possible to produce the disease in animals; and, again, sympathetic ophthalmia may have its own specific organism.

It is possible too that the disease is not of bacteric origin, but that an organism of some other class may be present. And again, we have strong reason for believing that the lower animals do not have sympathetic ophthalmia, just as they do not have many other diseases peculiar to the human race.

The experiment here recorded I regard as strong proof against the views set forth in the work of Deutschmann.

ON THE PATHOLOGY OF CIRCUMBULBAR DERMOID CYSTS.

By Dr. J. MITVALSKY,

LECTURER ON OPHTHALMOLOGY AND ASSISTANT TO THE ROYAL BOHEMIAN EYE-CLINIC IN PRAGUE.

Translated by Dr. Ward A. Holden.

(*With Plates IV., V., VI., and VII., of Vol. XXIII., Germ. Ed.*)

TWO years ago I examined clinically and microscopically a dermoid cyst of the orbit, of the size of a hen's egg, the wall of which presented such a peculiar structure that it was incomprehensible to me, nor did the literature of the subject assist me in explaining it. There remained nothing then but a systematic study of the cysts so often found in the neighborhood of the orbital margin to clear up the subject, which seemed to me of the greatest importance, as it interests not only the oculist, but the surgeon, the gynæcologist, and even the physician, since the cysts in the cavities of the body and in the organs may grow to tumors of great size. The cysts on the surface of the body occur by preference in particular localities, depending upon their mode of development, principally about the head and neck, and in greatest number in the neighborhood of the eye ball.

The cysts in the neighborhood of the eye fall into two categories: first, those situated in the orbit, displacing the ball when attaining any considerable size—the so-called orbital dermoid cysts; and second by, dermoid cysts of the margin of the orbit. The latter category may be divided again into those for the most part within the orbital margin—dermoid cysts of

the lids; and those for the most part outside the orbital margin, mostly situated upward and outward,—cysts of the region of the brow. The latter, however, in rare cases, lie below the orbit, so the designation, cysts of the brow, is not suitable for all extra-orbital cysts.

The dermoid cysts of the lids may exceptionally extend backward forming a secondary tumor in the orbit, such cases having been described by Spencer Watson and others.

Berlin found the position of predilection to be to the nasal side of the ball, 53 per cent. of 51 cases examined having this situation. In the cases which I observed the cyst was on the temporal side, the location of 24 per cent. of these growths according to Berlin.

The cysts of the orbital margin, of which I observed 17 cases, were 14 times—82 per cent.—within the bony margin, 12 of them at the outer and 2 at the inner commissure; in 2 cases the tumor was outside the orbital margin and below the brow; and in one case the tumor lay below the external commissure at the margin of the zygoma.

REPORT OF CASES.

CASE 1.—A. S., a boy æt. six months, had a dermoid cyst the size of a pea in the right upper eyelid, above the outer commissure. The cyst being removed, the contents were white, friable, and almost dry, showing hairs visible macroscopically. Microscopically numerous flattened layers of horny epidemic scales were found, among which were round fat globules and many lanugo hairs. The greatest thickness of the cyst-wall was 0.25 *mm.*, the least 0.1 *mm.* Microscopically it showed the ordinary structure of the external skin with some modifications, consisting in an altered thickness of some of the layers at particular points, and in the variable size of the cells. Everywhere there is a thick corium lined internally with an epidermic layer. The corium shows its usual constitution of fibrillar connective tissue, with a varying number of flattened connective-tissue cells with spindle-shaped nuclei. The nuclei are fusiform in the superficial layers, shorter and thicker in the deeper layers. The cells are most numerous about the vessel walls, and here their nuclei are not so flattened. The corium cannot everywhere be separated into distinct layers corresponding to the pars papillaris and pars reticularis of the

external skin, and this is particularly the case in those portions of the cyst-wall in which the adnexa of the skin are wanting. In those portions where there are hair follicles, acini of sebaceous glands, and coils of sweat glands, the corium is readily divided into a closely woven inner layer, and a coarser outer layer containing follicles and glands. The inner surface of the corium is smooth in almost its entire extent, showing only a few elevations covered with epidermis. There are no papillæ. An outer fatty layer is wanting, except in some parts, where it is seen to be a continuation of the subcutaneous adipose tissue. The epidermis differs from that of the outer skin first in its variable thickness. In some parts it is only 15-20 μ deep, and consists of a few layers of flattened germinal-layer cells, covered with an indistinct corneous layer; in other parts the epidermis has a thickness of 50 μ and more, consisting of a germinal layer of vertically or obliquely placed basal cylindrical cells, a middle layer of polyhedral cells, and a superficial layer of flattened cells. The hair follicles are scattered over the entire surface of the cyst, some having no hairs. The hairs, hair follicles, and glands are flattened, running parallel to the cyst-wall.

CASE 2.—A cyst the size of a pea above the left inner commissure in a child æt. three. Histology as usual.

CASE 3.—A cyst the size of a bean above the left outer commissure.

CASE 4.—A cyst the size of a bean above the right outer commissure in a boy æt. six. (Illustrated in Fig. 1.)

CASE 5.—A cyst larger than a chestnut above the left outer orbital margin and within the linea semicircularis.

The cyst was flattened. The frontal bone showed a fairly deep depression where the cyst was adherent, and it was removed entire only after having been emptied of its contents. The contents were of a dirty-white color, soft and atheromatous, containing numerous cast-off epidermic scales and fat needles. The cyst-wall showed a considerable number of vessels, the smaller ones surrounded with small-celled infiltrations, the larger arteries showing thickened walls as the result of an arteritic process.

CASE 6.—A cyst the size of a hazel-nut below the outer end of the right eyebrow.

The entire cyst-wall showed the usual structure except in a place 1-2 *mm* long, where the epidermis was completely wanting, and the inner layer of the cyst-wall was formed of granulation tissue rich in epithelioid and giant cells. The other layers were composed of fibrillar connective tissue. Our interest centres in the tracts lying in the inner two thirds of the wall (Fig 3), composed of cells stained yellow, with one or more nuclei. The most of these form a sort of sheath about capillary or precapillary vessels.

At one particular spot about 2 *mm* in diameter in the deepest portion of the corium we find tissue composed of round and typical giant-cells with innumerable nuclei. This is pervaded by vessels of small calibre, about which the giant-cells seem to be arranged (Fig. 4). This structure corresponds exactly to that of a giant-celled sarcoma, and, occurring in the outer layers of a dermoid-cyst wall, is remarkable.

CASE 7.—A boy, æt. thirteen, having a cyst the size of a hazel-nut situated beneath the left outer commissure on a level with the zygoma.

The contents were friable and without fatty matter or hairs. Part of the wall was lined with epidermis (corium), part with hypertrophic granulation tissue (Figs. 5 and 6). Along the longitudinal diameter of the cyst was a system of folds and furrows which, in transverse sections, appear as glandular formations (Figs. 5 and 6). It is remarkable that the granulation tissue does not contain the usual blood-vessels.

CASE 8.—F. D., æt. seventy-three, with a cyst the size of a small apple above the outer third of the right orbital margin.

The cyst was removed entire. There was a considerable depression in the bony margin of the orbit. Its contents were soft, like butter, of whitish color, leaving a grease-spot on paper, coagulating in low temperature, not affected by alcohol, giving up its fat with ether, and the latter evaporating, precipitating to a fine friable, half transparent, fatty mass. Melted over a flame a quantity of clear fat was obtained, thickly fluid at the temperature of the room, solidifying at 2° C. This was found to consist for the greater part of oleate and stearate of glyceril. Microscopic examination showed many fat globules and flat dermic cells.

The examination of the cyst-wall showed for the most part dermoidal structure covered in some places with a hyaline membrane (Fig. 8). A smaller portion showed granulation tissue (Fig. 7); one small spot (0.4 *mm*) presented the appearance of fibro-cartilage.

CASE 9.—L. W., æt. twenty-four, having a cyst the size of a pigeon's egg above the right outer commissure, which at the clinical examination was seen to be transparent, indicating oily contents.

The cyst was adherent to the frontal bone. Within the cyst was a colorless glycerin-like fluid with white flocculent masses, which coagulated when exposed to the air. A chemical analysis showed the oily mass to be composed of oleate and palmitate of glyceril.

The structure of the cyst-wall is shown in Figs. 9, 10, and 11.

CASE 10.—A girl, æt. sixteen, having a cyst the size of a hazel-nut above the left outer commissure.

The cyst was removed entire and hardened in alcohol. The contents were white, fatty, and contained many hairs. In this cyst we find two types of the extension of the granulation tissue; the first consists in the development of connective tissue at the expense of both the corium and the epidermis (Fig. 12); the second, in its development at the expense of the epidermis alone. (Fig. 13).

CASE 11.—A boy, æt. eighteen, having a cyst the size of a pigeon's egg above the left outer commissure. Structure as usual.

CASE 12.—A girl, æt. twenty, having a cyst the size of a hazel-nut above the left outer commissure.

The cyst was transparent. The contents consisted of a pure yellow oil mixed at the bottom of the cyst with a creamy mass containing short black hairs. The oil coagulated when exposed to the air. The structure of the cyst wall is shown in Fig. 14.

CASE 13.—A woman, æt. thirty-seven, had a cyst the size of a pigeon's egg lying beneath the inner and upper quadrant of the left orbital margin, pressing the inner half of the

left upper lid forward and filling the space between the inner upper wall of the orbit and the eyeball, without dislocating the ball.

The cyst could not be removed entire, and the contents escaped as a fluid colorless oil, coagulating at 33° C. Chemically it consisted of oleates and palmitates of glyceril.

At the bottom of the cyst was a white creamy mass containing many hairs. This was another of the so-called oil cysts. In the middle layers of the connective tissue making up the cyst-wall are many large masses of hypertrophic unstriped muscle, and also some bundles of medullated nerve fibres. The larger vessels show a great thickening of the tunica media, and in the neighborhood of the smaller vessels there are circumscribed small-celled infiltrations, giving the whole the appearance of a granuloma. These collections of round cells are often of considerable size, thus giving some resemblance to a small-celled sarcoma. In the inner layers of the cyst-wall are a few lanugo hairs.

CASE 14.—A case of cyst of the orbit, the size of a hen's egg, offering so many clinical and anatomical peculiarities that it will be described in detail.

September 17, 1868, a woman, æt. thirty-three, came to Professor Schöbl's clinic with the following history. From childhood her left eye had been slightly prominent, a fact which her parents attributed to a blow. She had always seen well with the eye until two months before, when she noticed a dull pain to the outer side of the eye, which gradually increased, the sight becoming affected at the same time and the ball becoming more prominent. The right eye is normal. The left eye protrudes, and is also displaced downward and inward. The palpebral fissure is narrowed, the inner commissure displaced inward, downward, and anteriorly. The lids cannot be closed. The motility of the ball is interfered with, particularly upward and inward. T — 1. The entire conjunctiva is in a condition of chronic catarrhal inflammation. The fundus shows the picture of papillo-retinitis with hemorrhages. $v = \frac{1}{60}$. The lachrymal gland is dislocated forward by the tumor, which is of cartilaginous consistency, with a smooth surface.

An absolute differential diagnosis between a dermoid and an echinococcus cyst was not possible.

I made an incision 4.5 *cm* long through the entire thickness of the lid below, and after the removal of the lachrymal gland the surface of the tumor presented itself to view. The cyst lay outside the muscular pyramid, filling the entire orbit and being attached to the optic nerve. Owing to the great difficulty in removing the tumor it was punctured, and a turbid fluid like soapsuds with some flocculent masses escaped. The cyst was now readily detached, except at the apex of the orbit, where it was necessary to remove also a portion of the optic nerve 1 *cm* long. The ball was replaced, a drainage tube inserted, and the wound united with sutures. The wound healed readily, and the patient was discharged on the ninth day, at which time the ball was somewhat prominent, the upper lid drooping. T − 2. The conjunctiva was slightly reddened, the cornea showed a superficial opacity at the seat of the previous ulceration, the anterior chamber was shallow, the pupil moderately dilated. The media were clear, the details of the fundus indistinct.

Eight months later the eyeball was normal in appearance, but had sunk somewhat into the orbit, motility much restricted; v = o.

The contents of the cyst, the fluid and the masses did not leave traces of grease on paper. No hairs were found. The masses showed cholesterine crystals and flattened horny cells.

The cyst-wall was on an average 3:4 *mm* thick, but irregular and furrowed; at one spot there was a plate of bone. No hairs were found.

One half was hardened in alcohol, the other in Müller's fluid.

Microscopic Examination.—Only in the posterior inferior quadrant of the cyst does the wall show traces of an epidermic lining. This consisted of a typical germinal layer with basal cylindrical cells, over which were polyhedral, and finally flat cells which did not stain and approximated a horny layer (Fig. 15, *a*). At both sides this epidermis becomes thinner, and the horny portion continues a short distance as a thin smooth layer which is detached from the underlying tissue and wrinkled.

In the cyst-wall two layers of connective tissue may be separated, an internal dense, close-meshed layer, and an external with wide meshes and depositions of fat.

This connective tissue contains a varying number of connective-tissue cells and a quantity of infiltration cells.

The internal layer of the cyst-wall is a dense, almost tendinous

layer showing no cells. Outside this layer the tissue is infiltrated with round cells often arranged like follicles (Figs. 15, 16). In some portions the cyst is lined with a system of glistening membranes 20-40 μ thick (Fig. 16, *a*), next to this a dense fibrous tissue, and outside this a looser tissue with infiltrations (Fig. 16, *b*) joining here and there the follicular structures. There is no doubt but that the round cells here form the connective tissue. At one spot the inner surface of the wall contained in its coarse meshes polynuclear cells. Similar cells projected into the interior of the cyst, but were more or less degenerated.

The circumscribed infiltrations (Figs. 15 and 16) surrounding each a blood-vessel, have in their substance no marked connective-tissue framework, and resemble a follicle or lymph gland.

The plate of bone mentioned above shows a structure halfway between spongy and compact, containing some marrow spaces with vessels and supporting tissue. Near the bone are a number of ossifying foci, some showing the structure of hyaline cartilage.

There are some peculiarities of structure in the neighborhood of the plate of bone. At one side there is a soft cellular tissue with no connective tissue or blood-vessel. At the periphery this tissue becomes myxomatous, and one ganglion cell was found in it. In the cellular tissue is a distended and œdematous sweat gland. The arteries show changes which consist usually in a thickening of the media, sometimes of the adventitia, and rarely of the intima, causing occlusion of the vessel (Fig. 18, *a*). The adventitia of the veins contains many round cells. A number of bundles of medullated nerve fibres were found.

REMARKS.

The physiological structure of the dermoid cysts varies within wide limits. In all the varieties the wall is composed of a connective-tissue corium and an overlying layer of epidermis, the variation consisting in the presence or absence of papillæ, muscle, and the various adnexa of the skin.

That variety showing hairs and glands is the most common, making up 85 per cent. of my cases. In one case only did I find sweat glands alone, and only in one were all the adnexa absent. Most of the cysts have an epidermis similar to that

of the external skin; some have a rudimentary epidermis; the hair follicles in the latter case, however, produce normal hairs. Occasionally both varieties of epidermis may be present in the same cyst.

In some portions of the wall in our first cyst the epidermis is reduced to a single or double layer of cells, having here and there horny excrescences of degenerated cells.

The corium also presents variations. Rarely are papillæ found regularly distributed over the cyst surface. These are mostly present at particular points only, where hair follicles are found. On the contrary, there are many cysts having hair follicles, but no papillæ. The papillæ, when present, are rarely regularly formed, but are, as a rule, flattened. Often there is no trace of papillæ, and the surface of the corium is then smooth, or there are projections of varying size and form which may be considered as microscopic fibromata. The folds of the inner layer of the corium are also interesting.

The hair follicles vary only in so far as they are formed either of normal epidermis, or of that with but one or two layers of cells. In some follicles one wall in the sections is seen to be lined with one variety of epithelium, and the second wall with the other. The hairs are sometimes cilia-like and sometimes lanugo-like in the same cyst. The sebaceous and sweat glands vary with the cyst.

As to the development of the cyst, we find that the nearer it is to fœtal life, the smaller it is, and the more regular its structure and the distribution of the adnexa. The first enlargement of the cyst occurs with the distension of its lumen by the secretion from the sebaceous and sweat glands, and the increase in the number of cast-off epidermic scales. This enlargement may then proceed in two ways: either the distension of the cyst-wall is uniform and the adnexa are separated uniformly and distributed regularly over all portions of the cyst-wall, or particular portions of the wall yield to the pressure and cause the further enlargement of the cyst, while other points retain their original structure and their original relation to the adnexa present. In the latter manner cysts develop which at particular points

show hairs and glands in their primary relation to the wall, while other portions have no trace of them.

The distended parts become thinner and the original perpendicular direction of the hair follicles, the hairs, and the excretory ducts of the glands take on an oblique direction and finally become parallel to the wall. All the structures of the cyst-wall become altered in the distension.

Through these changes a series of characteristic pathological processes are brought about. With the changed position of the hair follicles and the glands emptying into them, it becomes impossible for the secretion to reach the cyst cavity, and this leads to inflammatory interstitial processes in the acini of the sebaceous glands. The principal change in the sweat glands consists in a simple passive dilatation of the gland, with which may be associated the active development of the polypoid excrescences in the gland.

In a minority of the cases more or less extensive portions of the cyst-wall have no epidermoidal lining, and in place of this show a new-formed tissue composed of round, formative, and giant cells. This condition can only be explained by supposing that in the superficial layers of the corium there has been a plastic pathological process, which after the destruction of the epidermis leads to ulceration of the corium, in which granulation tissue appears and later cicatrizes. This granulation tissue differs from the ordinary chronic granulation tissue in its great number of giant-cells and in the presence of hairs. In the beginning it has no blood-vessels but is nourished by the vessels of the corium. Most of the vessels that develop are of the precapillary variety, and their walls are formed of a single layer of cells which elongate into short fibres.

The granulation tissue shows an exquisite progressive character and develops principally below the epidermis, gradually destroying the hair follicles and glands of the part. The hairs after the destruction of their follicles lie in the granulation tissue as unirritating foreign bodies. The hyperplastic granulation tissue may cover the deeper layers of the cyst-wall, in which the glands and hair follicles are long preserved but ultimately they are destroyed.

Hildebrandt[1] ("On the Secondary Implantation of Hairs in Dermoid Cysts." Ziegler and Nauwerk; *Beiträge zur path. Anat. u. allg. Path.*, vol. vii., p. 2) and Goldmann[2] ("A Case of Oil-Cyst, Containing Giant-Cells," *ibid.*, p. 3) thought the development of giant-cells in dermoid cysts to be dependent entirely upon the presence of hairs. We do not find, however, that the giant-cells are only in connection with the hairs, but they are scattered throughout the granulation tissue and are often found in those portions where hairs are completely wanting. In the cicatricial tissue, furthermore, hairs are found imbedded with no trace of giant-cells about them. We must therefore regard this excessive development of giant-cells as a peculiarity of the ulcerations in dermoid cysts, for there is no other granulation tissue excepting the tubercular which shows so many giant-cells. The development of these giant-cells may be dependent upon a particular irritation, probably that of the cyst contents on the open ulcer. The development of the sarcomatoid and giant cells in the corium near the granulation tissue, which cells are found mostly about the small blood-vessels, is also due to the irritation produced by the cyst contents.

We suppose that the beginning of the granulation tissue is a small-celled infiltration arising partly through diapedesis, partly through division and proliferation of fixed connective-tissue cells. This infiltration becomes organized and finally cicatrizes. In the dermoid cyst the cicatrization of the ulcer takes place through organization of the granulation tissue, the epidermis showing no tendency to proliferate and cover the cicatrix. Thus we find the cicatrized ulcers in a dermoid cyst without epithelium, and in those cases in which the ulcerative process has involved the entire inner surface of the cyst no trace of epidermis is found.

The ulcerative process stands in no definite relation to the age of the individual. We can only say that the younger the individual the more probable it is that there has not yet been ulceration. The oldest individual in whom the ulcerative process was wanting in the cyst, was over fifty years of age.

Where the position which the cyst had occupied could be

determined it was found that chiefly the anterior more exposed portions were involved in the ulcerative process, while the portions adherent to the bone, being more protected, preserved their epidermis longest.

Of secondary pathological changes were found the formation of hyaline cartilage, calcareous degeneration, and ossification; a degeneration into a peculiar cellular tissue containing ganglion cells; hyperplastic arterial changes with a remarkable endarteritis polyposa; and finally collections of lymphoid cells, resembling follicles, in the neighborhood of the altered vessels.

As to the cyst contents. The clinicians have made a distinct variety of the oil cyst, not recognizing their true nature. They overlooked the atheromatous portion of the contents, which lies mixed with a greater or less quantity of hairs at the bottom of the cyst. There are no dermoid cysts without atheromatous material, and some epithelium is always present.

We distinguish two sorts of oil which occur in the contents of these cysts. One is of a saturated yellow color, differing little in appearance from any other yellow organic oil, and composed of various oleates; the other is colorless, like glycerine mixed with water, and consists chemically of oleate and palmitate of glyceril. Both oils coagulate at the temperature of the room. In the manipulation of removing an oil cyst the white atheromatous masses with the hairs are detached from the bottom of the cyst and are suspended in the oily contents. Seven of our cysts had atheromatous contents, where the cast-off epithelium exceeded the fatty masses. In one the fat was found in a fluid state in vacuoles; in three the contents were fluid with small atheromatous masses; in two the contents were semi-fluid from the product of the sweat glands; in one case the entire contents consisted of atheromatous masses, fat and hairs being completely wanting.

The designations "dermoid cysts" and "atheroma" have been frequently confounded. The dermoid cyst is congenital, the atheroma is acquired and occurs mostly in adult life. The dermoid cyst begins with the dipping in and

cutting off of a portion of the epithelium in the embryo, and is a distinct bit of skin provided with the usual adnexa. The atheroma arises from the plugging and distension of a hair follicle or a sebaceous gland, and includes only a single follicle with its glands. Clinically the dermoid cysts are covered with a movable skin and lie close to the bone, although they may be movable above it; often, however, they are adherent to the periosteum and fixed. The atheromata are retention tumors of the adnexa of the skin, and as such move with the skin, except in cases of excessive growth. The dermoid cysts have positions of predilection; the atheromata develop rather on the forehead, brow, and cheek, places where the follicles have the longest course and become most easily affected. The cysts with oily contents are transparent, the atheromata are always opaque. In anatomical structure the dermoid cysts resemble the skin in every particular, and like this are subject to various pathological processes. The atheromata show a very simple structure, consisting of a thin connective-tissue layer lined with laminated layers of flattened epithelial cells which become dry and horny, and being cast off help to make up the contents of the cyst. The relation of the various constituents of the contents of the dermoid cysts has been spoken of above; the contents of the atheromata consist for the most part of concentrically arranged layers of horny epithelial cells, with which is mixed at first some fatty material from the sebaceous glands, but after these are destroyed no fatty material is discovered. Hairs may be found in an atheroma, but they are few and of one size and structure, as they must develop from a single papilla. In differentiating these two varieties of cyst, the presence of many hairs or hairs of different appearance is in favor of it being a dermoid, as does also the presence of much fatty material or particularly fluid oil.

We shall now pass to a *résumé* of the more important literature of the subject. Cruveilhier[1] reported two cases, one being a man of twenty-five, with a cyst above the outer commissure, which Dupuytren operated. An oily fluid escaped which did not mix with the blood, nor did it leave

a grease-spot; at the bottom of the cyst was a white, pulpy mass. The second case was a child of three, with a cyst above the outer commissure. Its contents were like butter, and left traces of grease on paper. Many fine hairs were found in the cyst-wall.

Demours[3] in his *Ophthalmology* is not so clear. Under "tumeurs enkystées ou loupes des paupières," he includes atheromata, melicerides, steatomata, hydatids, and even lithiasis of the lids, confounding various benign tumors with dermoids. In another place he says that one variety of these "loupes" may develop in the orbit causing displacement of the ball. Rosas[3] is much clearer. Under the cystic tumors of the lids, he gives meliceris, atheroma, and steatoma, saying that the first has contents similar to curds, and is almost always situated in the upper lid, particularly to the temporal side, and may reach the size of a dove's egg, or a small hen's egg. The atheroma is a pulpy and sometimes gritty encapsulated mass containing short, white hairs which spring from its entire surface, but have no bulb and are readily pulled out; its situation is the same as that of the preceding variety. The steatoma contains a white tallow, and is situated in the neighborhood of the eyelids, sometimes near the tear sac, and rarely exceeds the size of a hazel-nut. Rosas saw cystic tumors of the orbit, but gave no details from which we could conclude that they were dermoids. Rosas recognized dermoids as a well-marked, distinct group of tumors, and his great clinical experience gave him so clear a clinical and anatomical picture that we must conclude that by the old name which he used he understood dermoids.

Jüngken[4] recognized cystic tumors of the lids, orbit, eye-ball, and commissures. He includes under Rosas' designation all the subconjunctival cysts, and the so-called epibulbar open haired cysts. Only the clinical description of the orbital cysts, which he describes in a special chapter under the name "Steatoma Orbitæ," is more complete than that of Rosas.

Lawrence[5] described two cystic tumors containing hair in the neighborhood of the eye, the contents of one being

oily, and of the other fatty. He adds that when the sac is not completely shelled out, the operation wound does not heal. In one such case he was obliged to divide the fistula resulting and remove from the bottom of the wound a bit of the cyst-wall from which hairs were growing, after which the wound healed.

Cunier[6] reported two such cases. One cyst was situated in the upper lid, and one in the lower. Both showed red hairs, and the contents were oily.

Ryba[7] believed that hair follicles deep under the skin, growing in an unusual direction, were the cause of these hairy cysts.

Cramer[8] and Kerst[9] added further reports; the cyst described by the latter was the size of a chestnut, and was situated near the lachrymal gland, projecting into the orbit.

Ruete[10] gives under cystic tumors, meliceris, atheroma, and gumma, and remarks that the organized cyst at times is similar to the cutis or mucous membrane, and shows granulations and glands on its inner surface.

The contents consist of cell formations of various sorts, fatty matter, extractive material and salts, and at times bone and hairs. All these forms are found in the lids, in the orbit, etc. Some of these cystic tumors that contain cells and fat probably develop from the sebaceous glands of the skin; but for the greater number the cause is doubtful.

Hasner[11] in his chapter on "Cystic Tumors of the Eyelids" says that atheroma is frequently found here. Of 16 cases, 10 were in the upper lid, 8 in the outer half, 2 in the inner, and 4 in the lower lid, three of these just above the tear sac. In one case a tumor the size of a walnut was situated at the root of the nose, and in another 3‴ external to the outer commissure.

Walther[12] gave a good description of these tumors, particularly those of the orbit, calling them cysts.

Schuh[13] speaks of these tumors under the title atheroma. He understood their anatomical structure, and said that he had found them three times in the outer portion of the upper lid in young women.

Paget [14] described these cysts, and remarks that those which contain oil or fat without any other substance of higher organization, are rare.

While formerly the true nature of these cysts was not appreciated, Lebert [15] added much to our knowledge, and to him we are indebted for the name "dermoid cysts," he finding their walls similar in structure to the skin. He wrote his first papers in 1847 dealing only with the dermoid cysts of the subcutaneous cellular tissue; in 1852 he published an extensive monograph in the memoirs of the Paris Society of Biology on dermoid cysts of the various regions of the body. In 1858 he wrote again on the same subject in the *Prager Vierteljahrschrift*. Lebert was the first who gave us an almost classic description of the anatomical structure of the tumors of the hair follicles. He distinguished these from other cystic tumors, and made a precise differential diagnosis between them and atheroma. He based his views on 4 observations of his own and 17 of others, 10 tumors being situated in the superciliary region above or in the neighborhood of the upper lid, 4 at the root of the nose near the glabella, and 1 in the cheek. The rest were in other portions of the body. Lebert called attention to the fact that these tumors are frequently congenital. He described one dermoid three fourths of the inner wall of which was smooth, having layers of flat epithelial cells here and there, and the remainder of the wall being simply free connective tissue.

The differentiation which Lebert made between dermoids and atheromata was unfortunately soon overlooked. Förster,[16] on the ground of his histological studies, counted atheroma with the dermoids. His description was good, except for this one blunder, which still appears in the textbooks.

Gaillard [17] reported 20 cases of dermoids in the neighborhood of the orbit.

Heschl [18] blindly followed Förster in including atheroma in the dermoid cysts. As the epidermic layer makes up the principal mass of the tumor in the atheromata and the cutis is less important, Heschl calls them atheroma-epider-

moids. In his opinion they make up the first variety of the dermoids, and are produced by the same cause.

In the second variety Heschl includes only simple dermoid cysts, of which he reported 4; 2 of which were situated in the neighborhood of the orbit. Heschl rightly believed that all dermoids originate in intra-uterine life, and only become larger in extra-uterine life. He followed Remak's explanation of their origin, who believed that pathological formations of epidermis which appear beneath the surface of the skin are due to a separation of cells from the epidermis which occurs in early fœtal life (*Deutsche Klinik*, No. 16, 1854).

Lücke[19] gave a good description of dermoid cysts, and remarked that horny material sometimes rests on the papillæ of the cyst-wall.

Spencer Watson[20] described three cases occurring in the neighborhood of the eye, and pointed out that cysts originally lying at the margin of the orbit may gradually extend into the orbit and displace the eyeball. It is therefore advisable to remove the cysts at the outer orbital margin before such consequences occur. He often found the bone beneath them excavated or uneven, and from the continuous pressure a tumor originally outside the orbit may be found within it. The enlargement of the cyst is brought on by an accidental inflammation in the neighborhood. A cyst above the outer commissure forming an abscess, caused a marked exophthalmus.

Lamps[21] reviewed the papers already published on the subject, and reported nine new cases.

A very interesting paper by Mikulicz[22] treated only of the genesis of the dermoid cysts in the head.

Verneuil[23] published a description of three cases of congenital dermoid cysts, all near the inner commissure, and containing an oily fluid. They varied in size from that of an almond to that of a cherry. Verneuil believed that he had made a discovery and called the tumors "Kystes prélacrymaux."

The work of Vassaux and Broca[24] treated only of dermoid cysts with oily contents, and gives an accurate statistical

account of the publications on the subject. Besides this the authors examined histologically the wall of a small, transparent oil-cyst from the brow of a man æt. twenty-six, extirpated by Panas. The wall consisted of two different portions, one small and circular, where the cyst was adherent to the periosteum, showing a typical skin structure, and the remainder of the wall consisting only of connective tissue containing fat. At the points where there were small furrows seen microscopically, the deep connective-tissue cells were unchanged, but nearer the surface they were larger and contained often a number of nuclei, while the fibres were few. The process consisted in the development of connective-tissue cells and fat-cells into giant-cells, which undergo an albuminous degeneration.

For a considerable time the work of Vassaux and Broca was the only one in which the want of an epidermoidal structure in particular portions of the cyst-wall was regarded not as artificial but as pathological, although their explanation was not altogether correct. The works of Hildebrandt and Goldmann next following, called attention to the presence of granulation tissue in the portions of the wall which lacked epidermis, and to the finding of numerous giant-cells.

Berlin, in *Graefe und Saemisch*, speaks only of dermoid cysts of the orbit. He regards the dermoids as different from the atheromata. "Dermoid cysts are fœtal formations arising from the inversion of the epiblast." "The atheromatous contents of some cysts cannot be differentiated microscopically from the contents of true atheromata. Therefore the designation 'atheroma' should be given up and 'steatoma' and cholesteatoma adopted." In De Wecker-Landolt, dermoid cysts of the orbital margin are described among diseases of the lids under the name "Atheroma (Kystes sébacés)." In the beginning of the chapter atheroma is used in the true sense of the word, meaning retention cysts of the hair follicles. It is stated that their point of predilection is the upper outer margin of the orbit, but that they also are found above the inner commissure. In speaking of their location, atheroma in its proper sense is confused with dermoid cyst, and the two are considered

identical both here and in the portion treating of dermoid cysts of the orbit. De Wecker still uses the old terms atheroma, steatoma, cholesteatoma, and meliceris, which were invented when the contents of the tumor were alone taken into consideration and not the structure of its walls.

Berlin in *Graefe und Saemisch* reviewed the literature of 73 cases of dermoid cysts of the orbit reported before 1879, since which time the reports have been few. One case described by Cornwell [11] had an interesting clinical course. A patient æt. thirty-three was operated on for a cystic tumor of the orbit, the contents of which and so much of the wall as could be grasped with the forceps were removed. This caused a panophthalmitis, for which the eyeball was enucleated, after which he discovered a second cyst deep in the orbit. This was incised and the contents, as before, squeezed out and a bit of the cyst-wall removed. A week later Cornwell was surprised to find a third cyst at the upper inner angle of the orbit, which he operated in his own manner as in the case of the other two. It is not clear whether there was a single cyst or three communicating ones, and no attention was given to the character of the cyst-wall. A simple dermoid cyst operated in such a primitive fashion would readily return.

In the case reported by Lopez [12] a dermoid cyst beneath the upper outer roof of the orbit, which he calls a "Kyst sébacé," had by its presence caused a neuro-retinitis, and for this was removed.

Pfalz [13] observed a cyst the size of a pigeon's egg in the inner upper portion of the orbit in a woman æt. fifty-four. The histological examination showed it to be of dermoid structure. This was probably a cyst of the orbital margin which had extended inward.

Kuntzen [14] described a cyst of the inner upper portion of the orbit which he had extirpated. It had a dermoid structure. The vessels were partly surrounded with masses of granulation tissue which made the internal layers of the wall project inward. The latter showed no epithelial covering.

The last case that I have found was reported by Lichar-

evsky." This cyst was the size of a pigeon's egg and was situated in the upper outer portion of the orbit. It was excised with preservation of the ball.

In conclusion, I would express my thanks to Professor Schöbl for putting thc clinical material at my disposal.

Explanation of the Figures.

FIG. 1 (Case 4).—*a*, rudimentary epidermis ; *b*, corium ; *c*, hair follicle, cut obliquely, showing a large and two fine hairs, and at the side of the latter a degenerated acinus of a sebaceous gland ; *d*, fat-cells.

FIG. 2 (Case 6).—Section through the periphery of the ulcer. New-formed granulation tissue composed of round, epithelioid, and giant cells ; the two ends of the germinal layer and the horny layer still preserved and one hair cut obliquely.

FIG. 3 (also Case 6).—Section through a portion of the cyst-wall near the granulating surface, but still covered with thickened epidermis. The yellow epithelioid cells are seen arranged for the most part in tracts, and in places the relation of these cells to the blood-vessels, that has been spoken of, is recognized.

FIG. 4 (Case 6).—A giant-cell resting on a precapillary vessel.

FIG. 5 (Case 7).—Shows the thickened end of the epidermis growing over the connective tissue.

FIG. 6 (Case 7).—Shows a sac-formed structure filled with granulation tissue.

FIG. 7 (Case 8).—The end of the epidermis and beneath it the acinus of a sebaceous gland. The remainder represents the peripheral portion of the granulation surface, with numerous giant-cells and hairs. *a*, a giant-cell inclosed in a connective-tissue capsule ; *b*, the fungus-shaped giant-cells projecting inward ; *c*, hairs.

FIG. 8 (Case 8).—Section tangent to the granulation surface. The epidermis is partly replaced by a vitreous membrane. In the entire thickness of the wall are groups and layers of yellow cells with one or several nuclei.

FIG. 9 (Case 9).—Showing the papillary projections of the corium, the formation of the atheroma (*a*) from a hair follicle, and the interstitial inflammation of the acini of the sebaceous glands (*b*).

FIG. 10. (Case 9).—A portion of the wall with hyperplastic

changes in the misformed sweat glands (*b*, *c*), and the ectatic normally formed sweat-gland convolute (*d*) with its probable excretory duct (*a*).

FIG. 11. (Case 9).—In the middle of the cyst-wall of the portion without epidermis are, in the connective tissue, the remains of acini of sebaceous glands (*a*) with their excretory ducts and hair follicles (*b*).

FIG. 12. (Case 10).—The transition between the portion with epidermis and that without; in the granulation tissue hairs have grown; *a* is the swollen epidermis end with hyperplastic granulation tissue; *b* is a microscopic atheroma with a neighboring acinus of a sebaceous gland covered with granulation tissue.

FIG. 13. (Case 10).—Another section. Here the hyperplastic granulation tissue takes the place of the epidermis, and covers the still unchanged corium with its adnexa.

FIG. 14. (Case 12).—The periphery of the island of skin, recognizable by the epidermic covering ending there and by the sebaceous gland, passes over into the portion of the wall lacking epidermis, where sarcomatoid cells appear.

FIG. 15. (Case 14).—Here the island of epidermis is shown resting on the wall; and besides this, about the middle of the cyst-wall an artery (*b*) about which is a follicle-shaped accumulation of round cells (*c*).

FIG. 16. (Case 14).—The internal surface of the cyst is covered with a vitreous membrane (*a*), beneath which is a fine-fibred connective tissue formed from the underlying round cells (*b*). *d* is a large artery, the walls of which show inflammatory thickening; about the vessel a follicle-shaped accumulation of round cells (*c*).

FIG. 17. (Case 14).—Here is shown the cystadenoma papilliferum arising from the sweat-gland convolute.

FIG. 18. (Case 14).—A vessel with polypoid endarteritis: *a*, adventitia; *b*, media; *c*, thickened intima; *d*, the polypoid tumor springing from the intima.

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FIFTY-FOUR CASES OF CATARACT EXTRACTION.

By J. H. WOODWARD, M.D., Burlington, Vermont,

Professor of Ophthalmology and Otology in the Medical Department of the University of Vermont.

THESE operations were performed between September 8, 1887, and December 10, 1891. Seven were performed in private houses, forty-seven were performed at the Mary Fletcher Hospital. In every instance an attempt was made to secure asepsis. The method practised in most of the cases was as follows: The eyelids and eyebrows were washed with $\frac{1}{5000}$ solution of bichloride of mercury and the conjunctival sac thoroughly irrigated with saturated solution of boric acid several times during the day preceding and on the morning of the day of operation. Just prior to the operation, after the anæsthesia was complete, the same disinfection and irrigation were repeated. The instruments were plunged for a moment into boiling hot water and laid upon a clean napkin in the instrument tray. The corneal incision was made at the junction of the clear cornea and the limbus. Great pains were taken to make a smooth wound. A moderately large iridectomy was then made. Of course I am aware that it is rather old-fashioned, in these days, to prefer the combined operation. Possibly, had my single simple extraction given me less trouble, I should have repeated the operation on other patients. But my patient unfortunately sneezed about two hours after the extraction. Inasmuch as he experienced no pain or discomfort in the eye, I did not examine it until the fifth day, when I found a prolapse of the iris firmly healed in the wound. Subsequently I met with more difficulty in making a satisfactory iridectomy, of which, being necessarily through another

region of the cornea (downward), considerable irregular astigmatism was the unavoidable consequence.

For the capsulotomy, I prefer the Knapp cystotome, and I am confident that the best results follow when the capsule is cut transversely near the upper margin of the lens as well as vertically through the middle of the pupillary region. All cortical detritus in the anterior chamber was removed as thoroughly as possible (or advisable) with the scoop or by irrigation. In one case I irrigated the anterior chamber with a saturated solution of boric acid; in the remaining cases, I used a warm 1 % solution of common salt, sterilized by boiling. The irrigating instrument resembled a very large medicine dropper, the nozzle of which was brought close to the corneal wound, but never introduced into the eye. I think irrigation of the anterior chamber may cause iritis. Such was the effect in two of my cases, 29 and 45. The irrigating fluid in No 29 was saturated solution of boric acid—too strong; in No. 45, I used the 1 % saline solution, and I have since thought that possibly the solution was not sterile. My experience, therefore, cannot be considered unfavorable to the practice of washing the anterior chamber. Certainly irrigation removes cortical detritus more thoroughly than the scoop. In these cases I instilled sterile atropine drops after the operation, as I have done in other cases in which, for one reason or another, I feared an attack of iritis. No doubt this in some cases was an unnecessary precaution.

Both eyes were covered after a final irrigation with saturated solution of boric acid, with a combined dressing of $\frac{1}{5000}$ bichloride gauze and absorbent cotton. The eyes were not examined for 48 hours or longer, if the patients were comfortable. Whenever I have been anxious respecting the possible advent of iritis, or whenever the eye has been uncomfortable, the eye has been dressed more frequently.

My patients were confined to bed, as a rule, one or two days, on a light diet in a moderately darkened room. On the third day, sometimes on the second, I have permitted most of them to sit up in a chair. This is always a great comfort to these patients, and has never proved harmful in

my experience. The unoperated eye was uncovered on the fourth or fifth day, and dressings were removed from the operated eye about the seventh day. After a day or two more with dark glasses, the patient was permitted to leave his room.

Case 1. Mrs. Isaac Morse, æt. seventy-nine, Ext. R. E., September 8, 1887. Anterior chamber filled with blood. Wound healed in one week. Three weeks later paracentesis for removal of unabsorbed blood. Pupil clear after this operation. Patient a chronic invalid from cardiac disease and chronic bronchitis. Able to read newspaper with glasses. No other test made.

Case 2. Mrs. Ruel Thomas, æt. sixty-two, Ext. R. E., May 4, 1888. Healing in about 10 days. V = $\frac{20}{40}$; Jaeger No. 4, rapidly. One year later no deterioration of sight.

Case 3. Mrs. S. O'Neil, æt. sixty-five, Prelim. iridectomy R. E., July 2, 1888. Severe plastic iritis with large hypopyon; later large iridectomy and extraction. V = p.l.

Case 4. Mrs. S. O'Neil (continued). Ext. L. E., February, 1889. Normal healing, 10 days. Does not know letters. Vision satisfactory.

Case 5. Mr. Kinsman, æt. eighty-three, Ext. R. E., October 25, 1888. Healing normal. Able to get about without glasses. No record of V preserved. Capsule too thick. Intended to make a discission later. Have not seen him since.

Case 6. Mr. Ralph Moore, æt. sixty-four. Ext. L. E., December 31, 1888. Cataract hypermature. February, 1889, obliged to open anterior chamber to remove cortical detritus. Iritis. Could see to read for a brief time. Finally pupil occluded. Iridectomy. Fresh iritis and final occlusion of pupil, several (3) months later. V = p.l.

Case 7. Mr Ralph Moore (continued). Ext. R. E., May 4, 1889. Operation smooth, pupil clear. Iritis 5th day. Under control in three weeks. Discharged with eye only slightly irritable. Iritis relapsed. V = p.l.

Case 8. Mr. Isaac Stafford, æt. seventy. Ext. L. E., March 6, 1889. Healing in about 10 days. V = $\frac{20}{60}$; and newspaper. April 29, 1890, unable to read his paper. Secondary cat. discission. Restored, reading V.

Case 9. Mrs. A. C. Baldwin, æt. sixty. Ext. R. E., May 3, 1889. Ptosis, hence iridectomy downward. Heart's action very feeble. Discharged in 3 weeks. V = $\frac{8}{9}$; Jaeger No. 1.

Case 10. Mrs. P. Wynn, æt fifty (?). Ext. R. E., April, 1889. Cortical detritus removed from anterior chamber with scoop. V = $\frac{20}{200}$. Capsule thick. October 1, 1889, discission. Capsule tough. Irido-choroiditis, very severe. Eye recovered with very good vision. No further record of it. July, 1890, while menstruating V in R. E., suddenly failed. Ophthalmoscope revealed detachment of retina.

Case 11. Mrs. P. Wynn (continued). Ext. L. E., April 28, 1890. Discharged May 10. V = $\frac{20}{40}$; Jaeger No. 2.

Case 12. Mr. R. Arnold, æt. sixty. Nuclear cataract in each eye. Iridectomy R. E., by another surgeon in 1888. Nebula over centre of both corneæ. Ext. R. E., August 3, 1889. Discharged September 1. V = $\frac{30}{100}$; Jaeger No. 6.

Case 13. Mr. R. Arnold (continued). Ext. L. E., April 28, 1890. Iridectomy downward. Discharged May 10. V = $\frac{6}{10}$. Since the operation, has resumed his work, harness-making.

Case 14. Mr. H. E. Sheldon, æt. sixty-nine. Ext. L. E., November 7, 1889. Discharged November 12, owing to serious nostalgia. V = $\frac{20}{40}$; Jaeger No. 1, with difficulty.

Case 15. Mr. Frazier, æt. seventy-seven. Mature senile cataract in R. E., immature cataract in L. E. Suppuration of r. lachrymal sac. Treated sac two weeks, when, discharge being very slight, decided to operate, hoping to prevent infection of the wound. November 26, 1889, Ext. R. E.; November 27, eye doing well; November 28, profuse discharge from lachrymal sac. November 29, commencing keratitis at the wound. Panophthalmitis, eye lost. V = 0.

Case 16. Mr. T. S. Snow, æt. thirty-five (?). Traumatic cataract in L. E. Injury about one year ago. Foreign body visible in the cataractous lens. Ext. L. E., December 26, 1889. Fragment of steel found in the cataract. Discharged in about 10 days. V = $\frac{6}{30}$; Jaeger No. 2.

Case 17. Mr. P. Sherwood, æt. sixty-two. Ext. L. E., July 4, 1889. Discharged July 25. V = $\frac{20}{40}$; Jaeger No. 1.

Case 18. Mr. P. Sherwood (continued). Ext. R. E., October 3, 1890. Discharged November 5. May 30, 1891, R. V = $\frac{6}{30}$; L. V = $\frac{5}{10}$. Secondary cataract. Discission. Improved. No further record.

Case 19. Mrs. S. E. Smith, æt. sixty. Ext. L. E., January 23, 1890. Healing in 10 days. Discission March, 1890. V = $\frac{6}{30}$ +; Jaeger No. 2.

Case 20. John Sheahy, æt. sixty (?). Ext. R. E., February 17, 1890. Discharged February 25. Patient removed dressings from eye first night. Does not know letters. V good.

Case 21. Mrs. Kendricks, æt. fifty-two. Ext. R. E., April 23, 1890. Discharged May 5. V = $\frac{6}{30}$: Jaeger No. 2.

Case 22. Mr. Washburn, æt. sixty-eight. Ext. R. E., April 22, 1890. Discharged May 5. V satisfactory. Have not seen him since discharged, but learn that his distant V is good and that he can read some.

Case 23. Mr. C. E. Donovan, æt. thirty (?). Traumatic cataract R. E. Injury one year before. Dark spot near front capsule of cataract. Ext. R. E., May 31, 1890. Foreign body found in cataract. Discharged about tenth day. V = $\frac{5}{10}$. One year later V = $\frac{6}{10}$; complained of diplopia, especially with glasses.

Case 24. Mr. P. V. Manwell, æt. seventy-three. Ext. R. E., June 18, 1890. Discharged June 30. V = $\frac{6}{10}$; reads newspaper.

Case 25. Mrs. McGaffany, æt. sixty-seven. Ext. L. E., May 7, 1890. Discharged May 19. Operation smooth. Very slight iritis during healing. Prior to operation, patient appeared to locate light correctly, but could not be certain that her answers were reliable, owing to her stupidity. Detachment of retina and p.l. found after operation. Nothing in healing or operation to account for these facts.

Case 26. Mr. L. Fairbanks, æt. sixty. Simple ext. R. E., July 25, 1890. Operation smooth. Sneezed two hours after. No pain. Examined eye five days later, longer prolapse of iris. Discharged August 11. Subsequently performed iridectomy downward, also made discission. V = $\frac{6}{9}$. Irregular astigmatism.

Case 27. Mrs. Fletcher, æt. seventy-two. Ext. R. E., August 13, 1890. Discharged September 4. V = $\frac{4}{10}$; Jaeger No. 1.

Case 28. Mrs. Chambers, æt. sixty-five. Cataract in both eyes, complicated by high degree of myopia. Ext. R. E., October 5, 1890. Patient unmanageable, disturbed dressings. Panophthalmitis. October 10, evisceration. V = 0.

Case 29. Mrs. Mary Courteney, æt. sixty-five. Ext. R. E., January 14, 1891. Washed anterior chamber with 5 % solution boric acid. Plastic iritis. Discharged January 26. Readmitted to hospital February 16, 1891, for iritis. Discharged cured in about three weeks. Patient does not know letters. Eye perfectly clear. Vision good.

Case 30. Mr. A. Abbott, æt. sixty-eight. General health very feeble. Ext. L. E., February 13, 1891. Washed anterior chamber with warm sterilized 1 % saline solution. Discharged February 23. V = excellent. Precise record lost. Discission July 23. V improved. General health much improved since extraction.

Case 31. Mr. G. H. Pilling, æt. seventy-four. Ext. R. E., February 28, 1891. Discharged March 17. Organic disease of heart which troubled him some. V = $\frac{6}{10}$ +; Jaeger No. 2.

Case 32. Mrs. J. M. Hoyt, æt. sixty-four. Ext. R. E., April 27, 1891. Discharged May 4. General health very feeble. V = $\frac{6}{30}$; Jaeger No. 1.

Case 33. Mrs. Crimmins, æt. sixty-five. Ext. R. E., April 24, 1891. Ether anæsthesia. Discharged May 9. Old nebula of both corneæ. Does not know letters.

Case 34. Mrs. Crimmins (continued). Ext. L. E., November 16; discharged November 24. Ether. V very good in each eye.

Case 35. Mr. L. B. Soper, æt. fifty-nine. Ext. L. E., April 28, 1891. Prolapse of vitreous. Rupture retinal artery at midnight, May 2, while asleep. Died, May 15, in uræmic coma. See detailed history of this case.

Case 36. Mr. Henry Marston, æt. fifty-four. Ext. L. E., May 1, 1891. Discharged May 11. Media perfectly clear. Does not know letters. V satisfactory.

Case 37. Mr. A. Ketcham, æt. seventy-seven. Ext. R. E., November 15, 1890. Discharged December 2. R. V = $\frac{6}{15}$; Jaeger No. 2.

Case 38. Mr. A. Ketcham (continued). Ext. L. E., May 4, 1891. Discharged May 16. L. V = $\frac{6}{10}$; Jaeger No. 2.

Case 39. Mrs. N. R. White, æt. sixty-eight. Ext. R. E., May 8, 1891. Discharged May 21. Washed anterior chamber with warm sterile 1 % saline solution. Slight iritis. Discission in July; V = $\frac{6}{10}$; Jaeger No. 2.

Case 40. Mrs. Tower, æt. seventy-five. General health feeble. Ext. R. E., July 18, 1891. R. V = $\frac{6}{30}$; L. V = $\frac{6}{30}$.

Case 41. Mrs. Tower (continued). Ext. L. E., July 28. Discharged about August 10. Jaeger No. 3.

Case 42. Mr. John Martin, æt. seventy (?). Ext. L. E., July 18, 1891. Discharged July 28. V = $\frac{6}{6}$; Jaeger No. 2.

Case 43. Mr. John Sarachon, æt. sixty. Ext. R. V = p.l.; L. V = $\frac{6}{30}$. Ext. R. E., July 23, 1891. Washed anterior chamber with warm sterile 1 % saline solution. Discharged August 2. R. V = $\frac{6}{10}$; Jaeger No. 2. Some diplopia with glasses.

Case 44. Mrs. Shepardson, æt. sixty-seven. Ext. L. E., July 28, 1891. Discharged August 11. V = $\frac{6}{10}$; Jaeger No. 2.

Case 45. Mrs. Birchmore, æt. forty-four. Ext. R. E., July 27, 1891. Cataract soft. Washed anterior chamber with warm sterile 1 % saline solution. Very severe plastic iritis. Discharged, August 25, with pupil occluded, to return. Readmitted December, 1891. Iridectomy, leaving large pupil. Capsule of lens covered with pigment. Discharged, to return for discission. Can see large objects.

Case 46. Mr. Beers, æt. seventy-nine. Ext. L. E., August 3, 1891. Iritis. Discharged August 26. Have not seen him since. R. requires an iridectomy.

Case 47. Mrs. A. J. Meeker, æt. seventy-two. General condition not good; very nervous; insomnia; thirst. Urine contains 12½ % sugar; total quantity of urine in 24 hours, 48 oz. Senile cataract. Ext. R. E., August 19, 1891. Discharged September 1. No reaction. November 11, 1891. R. V = $\frac{6}{10}$; Jaeger No. 2.

Case 48. Mr. W. Felch, æt. fifty-nine. Ext. L. E., October 15, 1891. Discharged October 27. V = $\frac{6}{12}$; Jaeger No. 1.

Case 49. Miss Steinhour, æt. sixty-four. Ext. L. E., October 28, 1891. Discharged November 7. V = $\frac{6}{9}$; Jaeger No. 1.

Case 50. Mrs. H. Thomas, æt. sixty-nine. Ext. R. E., October 28, 1891.

Case 51. Mrs. H. Thomas (continued). Ext. L. E., November 12, 1891. Discharged November 19. Eyes perfectly clear. Have not seen her since. Reports that with her glasses she can see as well as she ever could.

Case 52. Mr. Jacob Flint, æt. seventy-five. Ext. L. E., November 3, 1891. Cornea unusually collapsed, but anterior chamber filled in 24 hours. Diarrhœa on second day due to the drinking-water. November 7, patient very homesick and worried about his condition. Tongue parched. Discovered that he had been trying to get on without water and food. Insisted upon his taking iced Apollinaris water and more nourishment. November 10, condition much better. Wound healed. Removed dressings. Slight conjunctivitis. Discharged, owing to serious nostalgia, November 19. Attack of iritis, December. Requires an iridectomy, which will be made later.

Case 53. Mr. J. W. Mills, æt. seventy-two. Ext. R. E., November 18, 1891. Ether. Discharged November 25. Eye clear excepting extravasation of blood into vitreous from some deep vessel. Cannot make out source of the hemorrhage. December 18, hemorrhage came from a vessel at the macula. Cleansing rapidly. Chorio-retinitis at macula. Central V = $\frac{3}{60}$. Improving.

Case 54. Mr. Roscoe, æt. seventy-five. Ext. R. E., December 10, 1891. Cataract soft. Cleaned anterior chamber with scoop, leaving pupil clear. Fearing iritis, redressed. December 11, pupil not clear owing to swelling of some cortical detritus left in anterior chamber. Eyes very prominent. While wiping lower eyelid, I accidentally touched eyeball with cotton; patient winked violently, upper eyelid caught corneal flap and opened wound. Instilled cocaine, intending to clear the anterior chamber of swollen detritus. While raising upper eyelid patient again winked violently and expelled some vitreous. Cut off prolapse. Brought wound into good coaptation. Five days later wound bulging. After six weeks wound healed; pupil semi-dilated; ophthalmoscopic image pretty clear. Can see large objects very well without glasses. Discharged, to return in six weeks for spectacles.

EXTRACTION ON LEFT EYE, PROLAPSE OF VITREOUS, HEMORRHAGE FROM EYE ON THIRD DAY, DEATH FROM BRIGHT'S DISEASE TWO DAYS LATER.

CASE 35.—Mr. Lafayette B. Soper, Morrisville, Vt., aged fifty-nine years, consulted me April 15, 1891. He stated that two years before an extraction had been made in his right eye by Dr. Buller, of Montreal, and ten days after that operation was followed by a discission. His vision had been satisfactory for both far and near until recently, when his reading vision had failed. I found the eye clear, and no evidence of disease in it was visible to ophthalmoscopic examination. His left eye contained a mature cataract and the light-sense was normal. I advised an extraction of this cataract.

Patient stated that he had been under the care of his family physician for what he regarded as a slight ailment, that he had recovered from his illness, but was still rather weak. I inquired whether he had ever suffered from disease of the kidney, to which he gave a negative answer. I did not examine his urine, for, under the circumstances, it seemed to me superfluous to do so.

April 28, Mr. S. appeared at my clinic for operation, accompanied by his family physician. His general appearance was fairly good.

Cocaine anæsthesia; patient apparently calm. After section of cornea noticed that a prolapse of vitreous was threatening; directed my assistant to hold speculum away from the patient's eyeball. Immediately and quickly made the iridectomy and capsulotomy. As the cataract was presenting, patient by sudden and powerful spasm of the orbicularis drove the speculum upon his eyeball, causing prolapse of about one third of the vitreous; cataract expelled at the same time. Cut away vitreous, cleansed the wound, and secured good coaptation of the flaps. Very slight shrinking of eyeball. Dressed antiseptically. Absolutely no hemorrhage. About 7 P.M., some pain in the eye, lasting about half an hour.

April 29 and 30.—Dressed wound, eye in good condition; no inflammation.

May 1.—Union of wound, vision satisfactory, told him he might sit up the next day.

May 2, 12.30 A.M.—Notified by hospital that patient's eye was bleeding. Saw him about 1 A.M., found eye filled with blood and large clot protruding through the wound. Patient stated

that he had been awakened from a sound sleep by severe pain in left temple and eye and in a few moments felt blood running down his cheek. Redressed lightly and applied ice-bag.

May 2, 9 A.M.—Hemorrhage had recovered since last visit. Eye evidently lost as the blood came from a retinal artery. Found that patient's arteries were atheromatous; that he had a mitral insufficiency. Pulse rapid, marked nausea, and very nervous.

May 3.—Urine contained 50% albumen by volume. Slight oozing from the eye. Decided not to enucleate the eye, as it was not inflamed, not very painful, and the loss of blood was not endangering patient's life. For a few days his condition seemed to improve slightly. He then began to show more marked symptoms of uræmia, his strength failed gradually, and he died in uræmic coma two weeks after the artery burst in his eye. No autopsy. During all this period there was not the slightest suppuration in the vicinity of the eye.

This in my opinion was a case of sudden congestion of the brain such as occurs in chronic Bright's disease, which was relieved by rupture of an artery in the operated eye, rather than by a cerebral apoplexy.

SUMMARY.

Suppuration ensued in three of these 54 operations—Cases 3, 15, and 28. In Case 3, after the preliminary iridectomy, which was performed at patient's home among very unfavorable surroundings, a severe iritis with production of considerable pus in the anterior chamber became manifest after a few days. In Case 15, the wound became infected from the lachrymal sac. I performed this operation with full knowledge of all the dangers attending it, and to give my patient his last chance, hoping that I might ward off infection. The operation was very satisfactory; but after 48 hours pus was pouring into the eye from the lachrymal sac and the wound hopelessly infected. In Case 28 the patient was unmanageable, disturbed the dressings, and undoubtedly infected the eye with her fingers.

I am unable to account for the irido-choroiditis in Cases 6 and 7.

In this series appear two cases of traumatic cataract, in both of which a foreign body was in the lens.

There were 17 patients of 70 years or over. The oldest patient was 83.

The following table will show the result in these 17 cases:

NO.	DISTANT VISION.	READING VISION.
Case 1	No record.	Newspaper.
" 5	Able to go about.	Capsule too thick, discission required.
" 8	$\frac{12}{20}$	Newspaper.
" 15	0	0
" 24	$\frac{4}{20}$	Newspaper.
" 27	$\frac{4}{20}$	Jaeger No. 1.
" 31	$\frac{6}{20}$ *	" No. 2.
" 37	$\frac{4}{12}$	" No. 2.
" 38	$\frac{8}{20}$	" No. 2.
" 40	$\frac{8}{20}$	" No. 3.
" 41	$\frac{8}{20}$	" No. 3.
" 42	$\frac{5}{5}$	" No. 2.
" 46	Iritis, iridectomy required	
" 47	$\frac{4}{20}$	" No. 2.
" 52	Iritis, iridectomy required	Iritis due to his journey home; he was discharged because home-sickness had become a serious symptom.
" 53	$\frac{8}{20}$	Hemorrhage at macula.
" 54	Able to get about without glasses. Too early to determine ultimate result.	

In all cases, with three exceptions, the anæsthetic was 4% solution of the hydrochlorate of cocaine. Ether was required in three cases, owing to the nervousness of the patients. In one of these cases a hemorrhage into the vitreous from a vessel at the macula was found as soon as an ophthalmoscopic examination was made after the dressings were finally removed. The operation was perfectly smooth and the healing prompt. During the first two or three days subsequent to the operation the patient was not perfectly rational and was found at night wandering about his room. Is it fair to conclude that the hemorrhage was a consequence of the method of anæsthesia?

SYSTEMATIC REPORT OF THE PROGRESS OF OPHTHALMOLOGY DURING THE SECOND QUARTER (CONCLUSION), AND DURING THE THIRD AND FOURTH QUARTERS OF THE YEAR 1891.

By P. SILEX, Berlin; ST. BERNHEIMER, Heidelberg; and C. HORSTMANN, Berlin.

WITH THE CO-OPERATION OF

S. M. Burnett, Washington; Dantone, Rome; and Deus, Berlin; Hirschmann, Charkow; E. Marckwort, Antwerp; P. v. Mittelstädt, Metz; L. Werner, Dublin; C. H. A. Westhoff, Amsterdam; Schiötz and Ole Bull, Christiania.

Translated by Dr. Jas. A. Spalding, Portland, Me.

Sections XII.–XXI. Reviewed by Dr. P. SILEX.

(Concluded from p. 325 of this volume.)

XVIII.—RETINA AND FUNCTIONAL DISTURBANCES.

230. Baquis. Fatti istologici consecutivi ad anemia temporanea della retina. *Ann. di ottalm.*, vol. xx., 3, p. 161.

231. Brown, J. F. Glioma of the retina, with a history of three cases in one family. *Jour. Ophth., Otol., and Laryng.*, April, 1891.

232. Fischer, R. Cure of a case of embolism of the central retinal artery by rubbing the eye. *Deutsche med. Wochenschr.*, No. 23.

233. Hirschberg, J. Spontaneous recovery in a case of detachment of the retina in myopia. *Centralbl. f. Augenhk.*, vol. xv., p. 168.

234. Hoche, A. Binocular hemianopsia inferior and other sensory disturbances in a case of functional psychosis. *Arch. f. Psych. u. Nervenkrankh.*, vol. xxiii., 1, p. 70.

235. Kramer, L. On hysterical stammering. *Prager med. Wochenschr.*, No. 14, 1891.

236. NOYES, H. D. Hemianopsia. *N. Y. Med. Rec.*, April 4, 1891.

237. SIMI. Ambliopia nicotino-alkoolica. *Boll. d'ocul.*, vol. xiii., 12.

238. SPECHT, C. A critical review of the methods for detecting simulation or aggravation of visual disturbances. *Inaug. Diss.*, Bonn, 1891.

239. SPIERER. Complete recovery in a case of hemiamblyopia homonyma dextra, due to fright during a severe earthquake about the middle of September, 1883, in Smyrna. *Zeh. klin. Monatsbl. f. Augenhk.*, vol. xxix., p. 218.

240. THOMPSON, J. T. A case of retinal hemorrhage showing scotoma. Embolism of a branch of the retinal artery. *Ophth. Rev.*, vol. x., p. 161.

241. WILBRAND. On typical defects of the visual field in functional disturbances of the nervous system. *Jahrb. d. Hamburg Staatskrankenanstalten*, vol. i., 1889.

The experiments of BAQUIS (230) on rabbits are intended to show that karyokinetic changes take place when the supply of blood to the retina is suddenly checked but restored after a time. He made them by compressing the optic nerve and the ciliary blood-vessels near it with a loop and forceps for ¼ to 4 hours. After 4 to 10 days the eye was enucleated and the retina examined under the microscope. He came to the following conclusions: when the temporary anæmia of the retina lasts less than half an hour, it leaves none or only slight traces, which are confined to a slight karyokinetic reaction in the ganglion cells. When the exclusion of the blood lasts more than half an hour, more marked changes take place, which do not disappear, but progress and gradually lead to atrophy of the retina. In these cases a reaction sets in in all the nervous elements of the membrane, which manifests itself in the form of beginning division of the nuclei.

BROWN (231) reports two cases of glioma retinæ in the same family, one a boy of three and a half years, which was successfully removed; the other, also a boy of twenty-nine months, who remained healthy eighteen months after the enucleation. An older child died from what was probably the same disease. The other children are healthy. BURNETT.

HIRSCHBERG (233) reports three cases of recovery in high degrees of myopia, which had been under observation for eleven,

two and a half, and one and a half years. Iodide of potassium was given; the patients lay on their back and perspired, and a compressive bandage was applied.

KRAMER's (235) patient after an attack of hysteria had aphasia for a short time, followed by stuttering, which lasted several days. Besides other symptoms such as hemianæsthesia, ovarian pain, etc., there was amblyopia and concentric contraction of the visual field.

After a very thorough study of the literature of the subject NOYES (236) comes to the following conclusions:

1st. A want of uniformity in the just location of the boundary between the seeing and non-seeing fields in hemianopsia. 2. The continuance of a small central area in each eye in certain cases of double homonymous hemianopsia. 3. Sectorial defects—homonymous—are most likely to have their origin in the cortex of the occipital lobe, usually in the neighborhood of the cuneus. In these cases there may be an absence of other significant symptoms, except possibly, agraphia, mental blindness, alexia. 4. Sectorial defects may originate in the subcortical substance of the occipital lobes, but the defective portion of the fields is not so likely to be well defined in boundary as in 3; there may even be irregular spaces where the light is recognized, mingled with blind spaces. Hemiplegia, hemianæsthesia, etc., if present, signify proximity of the lesion to the anterior part of the visual radiation of Gratiolet. 5. Sectorial defects, quadrants, and other figures can arise from lesions of the tractus, but will be accompanied by other symptoms pointing to the temporal lobes or the base, such as paralysis, anæsthesia, etc. Here, as in all tract lesions, the blind region includes loss of light, color, and form-sense. 6. Loss of either color-sense or form-sense, with preservation of light-sense implies lesion of the cortex of the visual centre, either direct or indirect. 7. Hemianopic pupillary inaction signifies that the lesion is at the middle ganglia of the brain, or in front of them, viz., along the tractus, chiasm, or optic nerve. 8. It is certain that a topographical correspondence exists between the central visual centres and the retina, and that it is precise and extends to details. BURNETT.

SIMI (237) saw in a case of amblyopia from the abuse of tobacco and alcohol, besides a slight diminution of vision (V $\frac{18}{10}$), a central scotoma of 20 to 25°, which was absolute for blue, and relative for yellow, red, and green. The power of accommoda-

tion was also disturbed, varying between 1, 1½, and 2 D. A third remarkable symptom, which according to the author has never been observed before, was a kind of xanthopia, which lasted from twilight to sunrise. Total abstinence from tobacco and alcohol soon brought about a cure.

SPECHT (238) has carefully compiled all the different methods for discovering the simulation of uniocular blindness, and emphasizes the fact that in judging this question of simulation the general impression made must be considered, and that the diagnosis of simulation must be based on some positive result of the examination.

SPIERER (239) assumes a slight hemorrhage (therefore not hemiopia, but hemiamblyopia) in the left visual centre : recovery in a few months.

THOMPSON (240) reports a case of hemorrhage into the retina with a corresponding scotoma, followed by detachment of the retina. In a second case there was a scotoma corresponding to a triangular hemorrhagic spot in the retina. The spot disappeared in twenty-four hours, but that part of the retina did not regain its full sensibility.

WILBRAND (241) distinguishes several kinds of anomalies of the visual field in functional disturbances: 1. Limitations due to exhaustion. *a.* To the complete disappearance of the visual field. *b.* To a certain degree of concentric contraction. *c.* An "oscillating" visual field, *i. e.*, with transient zonular and insular scotomas. 2. Equal concentric contraction of the visual field. *a.* Temporary. *b.* Permanent and equal. 3. Uniocular hysterical and binocular temporary amaurosis. 4. Temporary reduction of central visual acuteness with only slight exhaustion of the visual field or none whatever without any demonstrable central scotoma. 5. Concentric contraction of the visual field in organic diseases of the brain, and the influence of distant cerebral foci upon the extent of the visual field. 6. Toxic amblyopias (except when they have existed long enough to have led to interstitial neuritis). 7. The scintillating scotoma.

XIX.—OPTIC NERVE.

242. BERNHEIMER, ST. On changes in the optic nerve in high degrees of sclerosis of the cerebral arteries. *v. Graefe's Arch. f. Ophth.*, vol. xxxvii., p. 37.

243. DE WECKER. Les indications de la resection simple du nerf optique. *Ann. d'ocul.*, vol. cv., p. 101.

244. FOX, L. WEBSTER. Resection of the optic nerve. *Med. and Surg. Rep.*, May 30, 1891.

245. GARNIER. A case of myxosarcoma of the optic nerve. *Zeh. klin. Monatsbl. f. Augenhk.*, vol. xxix., p. 208.

246. HIRSCHBERG, J., and G. CIRINCIONE. On hyaline globules in the papilla. *Centrabl. f. prakt. Augenhk.*, vol. xv., p. 166.

247. LIEBRECHT. Retrobulbar neuritis after the use of arsenic. *Zeh. klin. Monatsbl. f. Augenhk.*, vol. xxix., p. 181.

248. LIEBRECHT. Partial division of the optic nerve. *Ibid.*, p. 179.

249. MANZ. Anatomical description of a coloboma of the optic nerve. Meeting of the neurologists and alienists of south-western Germany. *Arch. f. Psych.*, vol. xxii., p. 517.

250. PAUW, W. En geval van acut vorloopende dubbelzydige opticus-atrophie. *Geneeskunde Tijdschrift voor Nederlandsch-Indie*, Deel xxxi., p. 19, Batavia, 1891.

BERNHEIMER (242) has found aneurismatic enlargement and deposits of bone in the carotid and ophthalmic arteries, and thinks that in those cases in which the latter runs tangentially to the direction of the fibres of the optic nerve it may cause atrophy by compression in old people.

When sympathetic ophthalmia has begun WECKER (243) performs enucleation followed with thorough disinfection of the wound, and if this operation is refused, he makes resection of the optic nerve or injects sublimate according to Abadie. As a prophylactic measure against sympathetic ophthalmia he performs resection of the optic nerve. MARCKWORT.

FOX (244), in this second communication, reports the case of a woman who in infancy was injured by a fork in the left eye. The sight of the right was lost by sympathetic ophthalmia, the sight of the originally injured eye remaining good. Years after, the left became sympathetically inflamed, and finally a section of the nerve in the right was done, causing the disappearance of all sympathetic symptoms. He cuts the nerve as close to the ball as possible. BURNETT.

The examination of GARNIER'S (245) case of myxosarcoma of

the optic nerve showed three kinds of cells: 1, with a round nucleus and one or more nucleoli; 2, spindle-shaped cells with an oblong nucleus; and 3, cells with an oval nucleus and usually stellate offsets. The nerve was atrophic; the tumor must be considered a gliosarcoma.

HIRSCHBERG and CIRINCIONE (246) found a large cavity in the optic nerve near the papilla filled with amorphous organic substance resembling elastin, and deposits of lime.

MANZ (249) gives an anatomical description of a case of coloboma of the optic nerve, the development of which he ascribes to imperfect closure of the fœtal cleft. Opaque nerve fibres he thinks are found more frequently in congenital psychic disturbances.

In a drunkard who had taken quinine for malaria, delirium tremens developed according to PAUW (250), with sudden decrease of vision. Six days later atrophy of the optic nerve was found $V = {}^{5}/_{60}$. WESTHOFF.

XX.—INJURIES, FOREIGN BODIES (PARASITES).

251. GUERENGHI, F. Clinical contribution to the physiology of the optic ganglion. *Arch. d'opht.*, vol. xi., No. 3, p. 242.

252. SANTOS FERNANDEZ. Loss of sight following a gunshot wound in the periorbital region. *Chronica med. chir. de la Habana*, 1891, March.

253. SCHANTZ, F. Injury to eye by shot wound. Recovery with complete vision. *Correspondzbl. des allg. ärztl. Vereins Thüringen*, 1891, No. 6.

254. ASTENGO. Enormous stone in the orbital cavity. *Boll. d'ocul.*, vol. xiii., p. 8.

255. CHIBRET. De l' aspiration appliquée à l'extraction du cysticerque du corps vitrée. *Soc. d'opht. de Paris*, 1891, Jan. 6.

256. CASEY A. WOOD. Electro-magnetic extraction of piece of steel from the vitreous chamber of the eye. *Amer. Jour. of Ophth.*, April, 1891.

257. F. B. EATON. Fracture of base of the skull causing total paralysis of both sixth cranial nerves and partial paralysis of the sensory root of both fifth cranial nerves. Tenotomy. Advancement of Tenon's capsule. *Med. Record*, May 30, 1891.

GUERENGHI (251), nine months after a contusion in the region of the left brow noticed the following appearances about the pupil

of the corresponding eye. On looking straight ahead, both pupils are of equal size and contract readily both from light and in convergence. But when the right eye is covered, the pupil of the left, looking in the distance, dilates to a width of 6 *mm* and remains immovable to light as well as in fixation on an approaching object, so long as the object remains in the direct line of vision. But immediately that the latter leaves this position so that the eye must converge, the pupil contracts and becomes almost a pin hole. The cornea has perception of touch but no pain, and the associated reflex palpebral contraction is somewhat tardy. These pupillary symptoms were observed in the case of a young man of twenty-three who, two days before, had received a severe contusion of the left brow, followed by a considerable exophthalmos, in consequence of intraorbital hemorrhage. After disappearance of the latter, some divergent strabismus and amblyopia still remained. The strabismus disappeared, and the sight, as result of the optic-nerve atrophy, remained $\frac{1}{4}$ with + 5.0 D. A second case of more serious injury (contusion and fracture) of the orbital bones showed altogether the same changes, though less pronounced, which the author regarded as a lesion of the ciliary ganglion. Through this ganglion the nerve fibres pass which supply the muscle of accommodation, as well as those which preside over reflex contraction of the pupil from light entering the same eye, whereas those fibres, which convey reflex impressions from the other eye, as well as those influencing contraction of the pupil in convergence, do not pass this ganglion.

V. MITTELSTÄDT.

FERNANDEZ (252), describing a number of cases, comes to the following conclusions: (1) Bullets do not always produce injuries to the eyeball and to the brain. (2) They may injure only the deep-lying parts of the visual apparatus. (3) Injury to the optic nerve or retina. (4) In the nerve these lesions consist of degenerations or neuritis. (5) Detachment of the retina may be brought about by contusion or choroiditis.

CHIBRET (255) in three cases of cysticercus attempted unsuccessfully extraction by the section according to Alfred Graefe. He thus hit on the idea of sucking out the cysticercus. In the third case, which had been previously operated on by the Graefe method unsuccessfully, he reopened the wound on the third day, and, by means of an "Anel" syringe with large canula, succeeded in aspirating the cysticercus and removing it.

ASTENGO (254) removed a stone, 28 *mm* long, 18 *mm* wide, and 9 *mm* thick, from the orbit of a fourteen-year-old boy. The foreign body was shot out of a little cannon and pierced the cornea and penetrated the entire globe without in any way injuring the lids. In spite of the severity of the injury, the enucleation consequent on removal of the stone was followed by no complications and the boy was discharged in thirteen days, comparatively well.

In WOOD'S (256) case a piece of steel had entered the eye through the cornea at its upper inner edge. The foreign body was not seen, but an incision was made in the sclera down and out, and the needle of a steel magnet introduced, and a piece of steel brought away. It weighed 17.7 milligrams. There was no loss of vitreous during the operation. In spite of lens opacity V = fingers at 1 *m*. BURNETT.

In EATON'S (257) case the paralysis of the fifth was only partial, the lips and eyelids and a part of the cheeks remaining sensitive. The converging strabismus of both eyes was treated by an advancement of Tenon's capsule. The condition was very much improved, though the patient passed from observation before the result was fully known. BURNETT.

XXI.—AFFECTIONS OF THE EYE IN GENERAL DISEASES.

258. FRIEDENWALD, H. Report of ophthalmological examination of Dr. Preston's cases of arterial sclerosis. *Jour. Am. Med. Assoc.*, 1891, May 2.

259. BATTEN, R. O. Some points on the relationship of the eye to the cardio-vascular system. *The Lancet*, 1891, pp. 970 and 1035.

260. SIMI. Ophthalmia and the spring. *Boll. d'ocul.*, vol. xiii., p. 7.

261. SPIERER. Kerato-malacia of the left and neuro-retinitis of the right eye in course of a meningitis. *Zehender's Monatsbl.*, vol. xxix., p. 222.

262. MÜLLER. Two cases of aneurism of the aorta. *Correspondenzbl. für Schweizer Aerzte*, 1891, p. 291.

263. DEBIERRE. A case of acromegaly with tabic symptoms and bilateral hemianopsia. *Rec. gén. d'opht.*, 1891, p. 12.

264. KAST. With regard to the symptomatology of Basedow's disease. *Jahrb. der Hamburger Staats-Kranken Anstalten*, 1889.

265. LIEBRECHT. Paresis of convergence in Basedow's disease. *Zehender's klin. Monatsbl.*, vol. xxix., p. 183.

266. SPENDER. On points of affinity between rheumatoid arthritis, locomotor ataxy, and exopthalmic goitre. *Brit. Med. Jour.*, 1891, p. 1169.

267. GULDENARM, C. WINKLER. Contribution to Surgery. *Weekblad van het Nederlandsch, Tijdschrift voor Geneeskunde*, 1891, vol. ii., p. 217.

268. BERNHARD. Regarding the nuclear paralyses of the eye muscles and their components. *Berliner klin. Wochenschr.*, 1891, No. 43.

269. BORDECKER. A case of chronic progressive paralysis of the eye muscles in a paralytic from tabes. *Berliner klin. Wochenschr.*, 1891, p. 573.

270. KÖHLER. A case of fracture of the base with unilateral paralysis of the abducens. *Berliner klin. Wochenschr.*, No. 18, p. 1891.

FRIEDENWALD (258) examined the fundus of 40 eyes in patients who were under treatment by Dr. Preston for general arterial sclerosis. Out of these he found in 12 cases local or general contraction of the arteries with abundant tortuosities; in 10 cases moderate contraction of the same nature. In 4 cases the vessels had whitish borders; 1 case showed hemorrhage at the disk and 7 seemed normal. BURNETT.

BATTEN (259) has observed that optic neuritis is very rare with myopia, and concludes from this observation that hypermetropia and myopia are not essentially local conditions but may be parts of the general condition of the vascular system. He concedes, though, that in some cases the refraction depends on local relations, for example, in persons with myopia in one eye and hypermetropia in the other.

SIMI (250) discusses the coincident outbreak, so often noticed in the springtime, of inflamed eyes, affections of the nasal mucous membrane, and skin of the face, and accepts as the ground for it an irritation of the branches of the trigeminus, which makes itself known through trophic disturbances in the corresponding nerve area. This increased vulnerability of the nervous system the author conjectures to be due to the thermo-clinical influence which the increasing intensity of the sun's rays in the spring has on plants and animals, and therefore in changes in the atmosphere. DANTONE.

MÜLLER'S (262) cases were distinguished by the fact that, in addition to the ordinary symptoms due to paresis of the sympathetic, the accommodation of the affected eye was also paralyzed.

DEBIERRE (263) describes a case of acromegaly from the clinic of Meyer. The nose, lower jaw, hands, and feet, excepting the nails, were markedly developed pathologically. This condition had gradually developed during the past six years. Besides this there was atrophy of the optic nerves. V R = could not perceive movement of hand. V L = $\frac{1}{10}$. Both sides well pronounced temporal hemianopsia. In addition were many tabic symptoms. According to Debierre the hemianopsia may be referred to an enlargement of the sella turcica, which has been demonstrated by sections in acromegaly. MARCKWORT.

KAST (264) found in 20 cases of Basedow's disease, in addition to symptoms already known, a contraction of the visual fields, in some of considerable degree, in others less pronounced.

SPENDER (266). In this paper attention is drawn to the occurrence in rheumatoid arthritis and exophthalmic goitre of the following similar symptoms—pigmentation of the skin, tachycardia, tremors, and spasms, etc., etc., also a few uncommon symptoms.

WERNER.

GULDENARM (267). A soldier twenty-five years old fell from his horse and received a kick on the skull. He had headache and vertigo but was not senseless. A swelling over the right side of the vertex. Gradually there came progressive disturbance of motility in the left arm. Since January, 1891, complete paralysis of left leg and left arm. Contraction of the visual field. Paresis of convergence. Diplopia. Vision each eye $\frac{1}{3}$. A point of tenderness on pressure over the right parietal bone, opposite the anterior central convolution. *Operation:* Release of a blood cyst in connection with the sagittal sinus. Separation of adhesions between the dura and pia mater. Removal of the Pacchionian granulations. Subsequent improvement: almost complete restoration of the visual fields and range of hearing; perfect recovery from paresis of convergence, and diplopia, and of the visual acuity.

In BORDECKER'S (269) case there existed at first a bilateral paresis of the abducens, followed very shortly after by immobility of the pupils. Several years later, symptoms of tabes and paralysis appeared. *Opth.*: blanching of the temporal half of the disk and later of the entire disk. On part of the eye muscles, the

nuclei, and emerging fibres of the trochlearis, especially of the abducens, were found microscopically degenerated; the central nucleus, and the anterior lateral nuclei, and also the peripheral eye nerves distinctly degenerated. The degeneration of the optic nerves resulted from an interstitial neuritic process.

In 97 cases of fracture of the skull which KÖHLER (270) was enabled to follow the history of at the Charité, there was present paralysis of the abducens in only one, and that of one side only, whereas of the facial it was encountered 22 times. This paralysis can appear most frequently in those cases of fracture which involve a rupture of the internal carotid in the cavernous sinus with resultant pulsating exophthalmus.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY DURING THE THIRD AND FOURTH QUARTERS OF THE YEAR 1891.

Sections I.–V. Reviewed by DR. ST. BERNHEIMER.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

TEXT-BOOKS, MONOGRAPHS, TREATISES ON GENERAL BIBLIOGRAPHICAL AND HISTORICAL SUBJECTS.

271. Eighth report of the eye clinic at Amsterdam.

272. DAVIS, A. E. Contagious eye diseases with statistical remarks. *New York Med. Record*, July, 1891.

At the Amsterdam hospital (271) 8,305 patients were treated. Of these 643 were admitted to the wards; 302 operations performed, amongst the latter 42 for extraction.

DAVIS (272) has collected all the statistics of the eye institutions in the United States, and found that out of 511,807, 27.50 % (140,755) were affected with contagious diseases. They were subdivided as follows: Conjunctival catarrh, 21.25 %; Granular conjunctivitis, 4.5 %; Pannus, 0.82 %; Purulent conjunctivitis, 0.52 %; Ophthalmia neonatorum, 0.42 %; Croupous conjunctivitis, 0.017 %; and Diphtheritic conjunctivitis, 0.052 %.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

273. STILLING. On the experimental production of exophthalmus. *France méd.*, Jan., 1891.

274. SYM, W. G. Albinism, a curious family history. *Trans. Ophth. Soc. U. K.*, vol. xi., p. 218.

275. JESSOP, W. H. On the consensual pupillary light-reflex in cases exhibiting the Argyll-Robertson pupil symptom in one eye. *Trans. Ophth. Soc. U. K.*, vol. xi., p. 179.

276. JUNG, P. Contribution to the differential diagnosis of the tuberculous and gliomatous diseases of the eye. *v. Graefe's Arch.*, vol. xxxvii., part 4, p. 125.

277. AUBERT, H. On the accuracy of ophthalmometric measurements. *Arch. f. d. ges. Physiolog.*, vol. xlix., p. 626.

278. DARESTE. On the mode of formation of cyclopia. *Ann d'ocul.*, vol. cvi., p. 176.

279. RINDFLEISCH. Contributions to the developmental history of congenital anomalies of the eyes. *v. Graefe's Arch.*, vol. xxxvii., part 3, p. 192.

STILLING (273) experimented on rabbits with regard to the artificial production of exophthalmus. Whilst Boddaert for the same purpose ligated the four jugular veins, and divided the two cervical bundles of the sympathetic, Stilling limited himself to the ligation of the two external jugular veins, and to dividing the cervical bundle of the sympathetic on one side only. Directly after the operation, œdema of the face appears, then swelling of the nasal mucosa, lachrymation on both sides, and a marked degree of exophthalmus on both sides which persists for from two to eight days. MARCKWORT.

The parents of SYM'S (274) patient were brunettes, and had no blond relatives. Nevertheless their first, third, fifth, and seventh children were albinos, whilst the rest were brunettes. WERNER.

JESSOP (275) communicates five cases in which the Argyll-Robertson pupil symptoms were present on one side only. The consensual perception of light was only present in the healthy eye. This clinical observation seems to show that the pupillary fibres of the optic nerve, as Darkschewitsch also seems to think, run along the visual pedicles. WERNER.

JUNG (276) describes a case each of chronic tuberculosis of the choroid and glioma of the retina. Both of them show how

readily the pathological anatomical examination makes the correct diagnosis possible. "The thickening of the optic nerve discovered after the enucleation of the case of tuberculosis made us suspect a glioma in contradistinction to the originally correct idea. In the case of glioma, on the contrary, a deposit resembling hypopyon in the anterior chamber suggested that the case was one of tuberculosis of the eye." The mass resembling hypopyon was discovered under the microscope to be a collection of glioma cells.

The author doubts the theory advanced by Gama Pinto of a combination of glioma and tuberculosis, and thinks that Pinto's case (No. 11, *Untersuchungen u. intraoculaere Tumoren*, Bergmann, Wiesbaden) was one of genuine chronic tuberculosis of the choroid, and not at all of glioma.

DARESTE (278) gives a good description (supplemented with sketches) of cyclopia. The first modification exhibited by the development of the cyclopia is the premature closure of the orifice of the first cerebral cyst. If the closure of the abnormal fissure is very premature a rounded excavation is formed, of varying form, and the single eye is formed by the coalescing elements of the two. Dareste also describes the formation of the olfactory groove which never unites with the oral cavity. The premature closure of the first cerebral cyst in cyclopes also retards the development of the cysts of the cerebral hemispheres.

MARCKWORT.

RINDFLEISCH (279) notes a case of bilateral microphthalmus with high degree of retinal ectasia in a young human fœtus, which exhibited further curious peculiarities; the extreme hydrocephalus internus as well as externus of the seven months' fœtus is drawn upon to explain mechanically (pressure on the orbit) the origin of the microphthalmus with cystic ectasia posterior.

The second part of the paper is devoted to a description of the pathological anatomy and origin of congenital absence of the iris. The anomaly in question is proved histologically to be the sequence of violent inflammatory processes.

III.—INSTRUMENTS AND REMEDIES.

280. DARIER. Subconjunctival injections of sublimate in ocular therapeutics. *Arch. d'opht.*, xi., No. 5. *Ibid., Cong. franç. d'opht.*, May, 1891.

281. ABADIE. Therapeutic value of medicamentous and subconjunctival injections. *Cong. franç. d'opht.*, May, 1891.

282. PFLUEGER. Subconjunctival injections of trichloride of iodine. *Cong. franç. d'opht.*, May, 1891.

283. GOLOWIN. On the use of hydrogen peroxide in ophthalmic practice. *Kaukas. med. Ges.*, xxviii., No. 2.

284. LEROY. A micrometic ophthalmoscoptometer. *Rev. gén. d'opht.*, 1891, p. 438.

285. COUETOUX. Bicycle spectacles. *Ann. d'oculist.*, cvi., p. 340.

286. MEGRIER. A new optometer. *Prog. méd.*, 1891, No. 39, p. 235.

287. SNELLEN. Skiascopy. *Ned. Tydschrift v. Genees.* Part i., p. 201.

288. PARENT. Optometric and phakometric ophthalmoscope. *Cong. franç. d'opht.*, May, 1891, and *Arch. d'opht.*, xi., p. 4.

289. RIED. Pocket astigmometer. *Cong. franç. d'opht.*, May, 1891.

290. OSWALT. Clinical ophthalmometry. *Cong. franç. d'opht.*, May, 1891.

291. PARENT. Models of mirrors for ophthalmoscopic examination in the erect image. *Arch. d'opht.*, xi., No. 4, p. 320.

292. PRENTICE. The prismometric scale. *Amer. Jour. of Opht.*, 1891, No. 10.

293. WUERDEMANN. A simple skiascope. *Amer. Jour. of Ophth.*, July–Aug., 1891.

294. BARTHOLOW. A few observations on the mydriatic alkaloids. *Med. News*, Dec. 12, 1891.

295. WOOD. Mixture of homatropin and cocaine as a substratum for atropin and duboisin in the determination of refractive disturbances. *Am. Jour. of Ophth.*, 1891, No. 6.

296. SIMI. Asepsis in ophthalmic surgery. *Boll. d'ocul.*, xiii., p. 21.

297. CRITCHETT. A capsulotome knife. *Trans. Ophth. Soc.* U. K., xi., p. 247.

298. BRITISH MEDICAL ASSOCIATION. Discussion on the vision of railway servants. *Brit. Med. Jour.*, Aug., 1891, p. 406.

299. PERCIVAL. The action and use of prismatic combinations. *Ophth. Review*, x., p. 285.

300. STORY. The ophthalmometer in practice. *Ophth. Rev.*, x., p. 193.

DARIER (280), supported by a large amount of material from Abadie's clinique, recommends the subconjunctival injection of sublimate in all cases in which mercurial treatment is indicated, and in which active procedures are imperatively demanded. The best effect is witnessed in kerato-iritis, and in parenchymatous or punctate keratitis. The treatment is very valuable in central chorio-retinitis, but useless in optic atrophies. The injections were in vain in four cases of irido-choroiditis, in which one eye had already been destroyed. The injections are made with a Pravaz syringe furnished with a canula resembling a cataract needle, which is kept in a 5 % solution of carbolic acid, and $\frac{1}{10}$ *mgr* of a 1-1000 solution is injected at a sitting. The pain is very slight, if cocaine has been previously employed. Later the eye smarts a great deal, and the artificially produced œdema feels very uncomfortable for a considerable length of time. If the injections are well borne, four can be tried in the space of eight or ten days, to one side or the other of the cornea. If then there is no noticeable improvement, the injections may terminate. The author has seen inflammatory chemosis, violent pain, photophobia, and even hypopyon follow the treatment, but thinks that these may have been due to a foul syringe, or to an idiosyncrasy.

ABADIE (281) having, as he thought, perceived good results from intraocular injections of sublimate in case of sympathetic ophthalmitis, experimented with the same in other eye diseases, and with alleged good results. One drop of a 1-1000 solution was employed in old rebellious syphilitic affections, in microbic infiltration of the cornea, in macular chorio-retinitis, and in choroiditis disseminata.

He also employed successfully ergotinin Parent in hemorrhagic glaucoma and hydrophthalmus.

PFLUEGER (282) has also tried sublimate in this manner, but now prefers trichloride of iodine in a physiological salt solution (1-2000). Experimental subconjunctival injections of fluorescin demonstrate that the tinting extended to the cornea, uvea, aqueous, vitreous, and to the superficial layers of the lens.

A long discussion followed the reading of these three papers, on intraocular and subconjunctival injections. Wecker regards transition from the intraocular to the subconjunctival injections as a decided advance, since the vitreous cannot be compared with

a subcutaneous tissue. He reported a case in his practice in which the injection was useless. Venneman asserted that he had cured a case of infection after cataract by subconjunctival injections. Galezowski has seen but moderate results from these injections. Motais regards the intraocular injections as much more rational than the subconjunctival. Chibret believes that the sublimate injections will be badly borne. MARCKWORT.

GOLOWIN (283) recommends peroxide of hydrogen in all cases of corneal and conjunctival ulcerations, as well as in impure wounds. With a minimum of irritation is here combined a maximum of antisepsis. HIRSCHMANN.

A skiascope is now used at the Utrecht Clinique (284) with glasses on each side which by combinations make a series of plus and minus D from 1 to 10. The distance has been decreased from 1 *m* to 60 *cm*. The glasses are held with the left hand in front of the patient's eye, whilst the right hand holds the mirror. 1,25 D has then to be added to the discovered M, and the same amount to be deducted from the H. WESTHOFF.

PARENT (288) has a new ophthalmoscope constructed on the design of Cooper's. It has (1) the combination of glasses from + 20 D to — 26 D, at intervals of 0.5 D; (2) cylindrical lenses from 0.5 to 6.0 D, with axial arrangement; and (3) movable mirrors of varying foci for convergent, divergent, and parallel rays. The instrument can be employed not only to determine the refraction, but after removal of the mirrors it can be used as an optometer, phakometer, and axiometer. A description is impossible without a diagram. v. MITTELSTÄDT.

OSTWALT (290) had previously asserted that the astigmatism discovered with Javal's ophthalmometer is ¼ greater than the actual corneal astigmatism. The topic was again brought forward at the French Ophthalmological Congress. Pflueger, Javal, and Leroy attempt to prove in the discussion that the assertion is not true. In Chibret's opinion the total astigmatism is generally somewhat greater than that discovered by the instrument in question. MARCKWORT.

PARENT (291), in order to have at hand either convergent, divergent, or parallel light in the determination of the refraction, has devised a mirror with interchangeable foci (at Giroux's, 58 Quai des Orfevres, Paris). It consists of a movable mirror, in front of which are a concave lens of 25 D and a convex lens of

the same strength. The latter is slightly bluish, and can be removed in the direction of the axis from the former, so that at a distance of 20 to 25 *cm* the source of light can obtain any desired sort of rays.

PRENTICE (292) goes into details in regard to the theory of refraction by lenses, and demonstrates by numerous drawings, that, in order for the refraction of a prism to agree with the laws laid down in the text-books, the bundles of rays must be parallel. If the cone diverges, the extent of the deviation is not the same, and at the same time we get a decided spherico-astigmatic action. He concludes from this, that all tests for prisms must be made with parallel rays, except in the slighter degrees (up to 4 prism dioptries or Grads). He gives a very simple scale for such measurements up to a distance of 6 *M*. He also shows how the prismatic action of a spherical lens can easily be determined with the same apparatus, and asserts that the deviation of a prism is not alike at base and summit. BURNETT.

WUERDEMANN'S (293) skiascope consists of an oblong blade of hard rubber, in which are fitted 12 plus and 12 minus glasses. The board has a handle, and by this the patient holds it before the eye to be examined, and moves it up and down as requested by the examiner. BURNETT.

BARTHOLOW (294), from his experiments as to the peculiar quality of the mydriatics, concludes that homatropin is best for eye operations and refractive work, and atropin for inflammations. BURNETT.

WOOD (295) found that the combination of cocaine and homatropin increases the cycloplegic action of the latter, and is as reliable as atropin itself. He has caused Wyeth of Philadelphia to prepare tablets containing of each drug 1–50 grain (0.0012), and so produces the desired effect in adults in 60 minutes. In young people a second tablet can be advantageously employed in 15 minutes after the insertion of the first. BURNETT.

SIMI (296) emphasizes the success of his operations due to careful production of asepsis before, during, and after the operation. He warns against the use of too strong solutions of sublimate, which cause exfoliation of the corneal epithelium, and thus produce a surface capable of infection. DANTONE.

In the discussion in regard to the sight of railroad employés (298) BEAUMONT, HARDY, MCKAY, and BRAILEY took part, show-

ing that the tests employed in testing the sight of these public servants were very unsatisfactory, especially because so often utilized by the ignorant laity. They all agreed that a committee should present the question to the Government for some legal action. WERNER.

In a paper on combinations of prisms, PERCIVAL (299) mentions the circumstances under which prisms can be practically employed, and presents a table which contains the value of the prismatic deviations, spherical combinations, or decentration of lenses. WERNER.

STORY (300) describes the practical value of the ophthalmometer in the determination of astigmatism. He uses Javal and Schiötz's apparatus. In all the cases in which the ophthalmometric investigation and the subjective determination of the astigmatism differed, examination in the erect image and retinoscopy were employed. In 67 out of 139 eyes the subjective astigmatism was less than that discovered by the ophthalmometer. The variation was generally about 0.5 D. In 9 cases it was still more. The instrument did not reveal any astigmatism in 96 cases, and astigmatism was nevertheless present in only two of all this number.

The author's opinion in regard to the practical value of the instrument is consequently extremely favorable. WERNER.

IV.—ANATOMY.

301. COLLINS. On the development and abnormities of the zonula of Zinn. *Royal London Ophthal. Hosp. Rep.*, vol. xii., p. 86.

302. COLLINS. The glands of the ciliary body in the human eye. Two plates. *Trans. Ophthal. Soc. U. K.*, vol. xi., p. 55.

303. HOSCH. Ehrlich's methylin blue method. *v. Graefe's Archiv.*, vol. xxxvii., part 3, p. 37.

304. PRICE. Persistent hyaloid artery. *Ophthal. Record*, Aug., 1891.

COLLINS (301) was able in an eye that had been enucleated from a child of three months on suspicion of a neoplasm, to study the development and abormities of the zonula of Zinn. He found a mass of cells and fibres extending from the lens, through which a persistent hyaloid artery coursed. The lens was shrivelled, the capsule collapsed, and the fibres of the hyaloid membrane could

easily be studied in all stages of development. In comparing this case with the results obtained in examination of the fœtal eye, he is forced to assume that the suspensory apparatus of the lens in formed in the following manner: Whilst the lens is still surrounded with the vascular membrane, adhesions form between it and the inner layers of the secondary ocular cyst. But as the globe grows faster than the lens, these adhesions are gradually drawn out into fibres with nuclei, which at a later stage entirely disappear.

Other alterations, such as ectopia and coloboma of the lens, can be explained in the same way. WERNER.

COLLINS (302) interestingly describes the results of his examination of the secretory portion of the ciliary body after bleaching it with chlorine water and muriatic acid. The iris pigment consists of two layers, the outer one of which is furnished with flat cells, which are united with the pars ciliaris retinæ. The outer layer remains pigmented, and in this shape extends into the ciliary processes and their folded portions. It exhibits small processes composed of groups of cells, which are partly arranged in parallel rows, and on flat sections exhibit a central orifice. The tubular character is best recognized when enlarged by pathological alterations. Serous iritis is, in the author's opinion, a primary catarrhal inflammation of these glands, as the microscopic examination demonstrates. In cyclitic membranes, these tubular structures have no pigment, as Alt has already shown. Collins also examined two tumors of the cilary body of an epithelial type. One of them he regarded as a melanotic carcinoma. WERNER.

HOSCH (303) reports the results of his examinations of rabbits' eyes with Ehrlich's method. The animals were first chloroformed to death, and then the thoracic aorta injected. The injection is ready in five minutes later. The fixation of the tint, the most delicate affair in the whole process, is best done by a saturated solution of picric acid ammoniac.

The corneal substance remains untinted, but the nerve twigs can thus be better than ever before followed out. Flat preparations exhibit beautifully the dichotomously branching nerve filaments, which course toward the centre of the cornea and form at that point the basal plexus. The anastomoses are interspersed with nodules. The iris of albinotic rabbits exhibits an abundant ramification of nerves, but there was no means of determining the relation in which the fine fibres stand to the smooth muscular

fibres, and their nuclei. The important question whether there are ganglion cells in the iris, the author does not hesitate to answer by asserting that in the nervous meshwork of the sphincter zone, there are cells which are to be regarded as nerve cells. They are spindle-shaped or triangular, but measure only 12 to 15 micromillimetres. He was also able in a single case to demonstrate an actual connection of the one or the other offshoots with medullated nerve fibres.

PRICE reports (304) an interesting case of persistent hyaloid artery in which the vessel could be followed from the art. cent. retinæ to the posterior capsule of the lens, where it spread out regularly into branches, not unlike the retinal vessels on the optic papilla. A remnant of the hyaloid artery was also seen in the other eye. BURNETT.

V.—PHYSIOLOGY.

305. MOTAIS. On the refraction of animals. *Cong. franç. d'opht.*, May, 1891.

MORAT and DOYEN. On the rôle of the cervical sympathetic in the accommodation for vision of distant objects. *France médical*, June, 1891.

307. LANDOLT. New investigations into the physiology of the movements of the eye. *Arch. d'opht.*, vol. xi., No. 5, p. 385.

308. SULZER. The form of the human cornea and its influence on vision. Part 1. The form of the cornea. *Arch. d'opht.*, vol. xi., part 5, p. 419.

309. QUERENGHI. Two cases of total achromatopsia. *Ann. d'Ottal.*, xx., part 4, p. 351. *Ann. d'Oculist.*, cvi., p. 333.

310. SCHMELEW. On the influence of cocaine in the imbibition from the conjunctival sac into the anterior chamber. *Russ. Medic.*, 1891, No. 41.

311. BERRY. Critical remarks on the theories of fundamental color-sensation. *Royal London Ophthal. Hosp. Rep.*, xii., p. 1.

312. STADERINI. On the exits of the aqueous humor. *v. Graefe's Archiv.*, xxxvii., part 3, p. 86.

313. HERING. Examination of a case of total color-blindness. *Archiv. f. d. Ges. Physiol.*, xlix., p. 63.

314. GREEF. Investigations on binocular vision, with the use of Hering's test. *Zeitsch. f. Psychol. und. Phys. d. Sinne.*, iii., p. 1.

315. ELBRIDGE-GREEN. A review of the tests for color-blindness. *Brit. Med. Jour.*, Aug., 1891, p. 470.

MOTAIS (305) observed in animals that imprisonment carried out through several generations transformed the hypermetropic refraction of the eye into myopic. He further relates that a cataractous lioness gave birth to two successive sets of cataractous cubs. MARCKWORT.

MORAT and DOYEN (306) detected a flattening of the lens after irritation of the cervical sympathetic. The curvature of the lens was determined by observation of Purkinjé's images, which increased in size during the irritation of the sympathetic. MARCKWORT.

Starting out with the observation, that the eye at a certain distance can singly count any number of similarly shaped objects arrayed in regular rows, but at a greater distance can only count the same objects by groups, LANDOLT (397) endeavored, in company with three other experimenters, to determine the smallest angle which the movement of the eye can embrace. They discovered after many tests that this amounted to about five minutes—that is to say, five times as great as the smallest angle of vision.

Another set of experiments demonstrated that when the eyes are to follow an uninterrupted line from beginning to end, *the movement of the eyes is not uniform, but by jerks.* These brief interruptions of movement were either observed directly, or perceived in the observer's own eye by the form of the after images of the line. They follow one another at distances of from 7° to 8°.

On reading a series of printed but disconnected words (yet such as were easily to be comprehended) the eyes made fewer interruptions than the number of the words, but more than when the words made an actual sentence. The same thing occurs in reading a foreign tongue and one's own. The more frequent the interruptions, *i.e.*, the smaller the angle, the easier the eyes tire. Perhaps this is the reason why children bring the book so near to the eyes, and thus fix each one of the words, and finally in this way enlarge the angle of the movement of the eyes, whilst with their good accommodation and convergence they easily enlarge the retinal images. v. MITTELSTÄDT.

SULZER (308) endeavored to measure the form of the cornea by repeated tests with Javal's ophthalmometer, and from the diagrams

attached, we learn: 1, that the central portions of the cornea (leaving aside astigmatism) differ but little from the segment of a concave sphere; 2, that at a distance of 15° (about two *mm* linear) from the intersection of the visual line and the corneal axis, the corneal radius increases with great rapidity, and the surface approaches the ellipsoidal form; 3, that the curvature from the summit of the cornea, or the intersection does not decrease, *uniformly in one and the same meridian.* The author calls this dyssymmetry, in contradistinction to the asymmetry in astigmatism. In the latter the dyssymmetry of the single meridian is slight. He also found that the curvature decreases upward and toward the nose more rapidly than in opposite directions. There is no foundation for the idea that muscular action is the cause.

The author further describes corneæ with irregularly curved surfaces, amongst which there are those with central flattening, and others with discontinuous curvatures. v. MITTELSTÄDT.

QUERENGHI (309) observed two cases of total achromatopsia. In addition to the lack of color-perception both patients exhibited a loss in vision ($S = \frac{1}{10}$), nystagmus, and extreme photophobia. The refraction was normal and there were no alterations in the fundus. In one case the field was concentrically contracted.

DANTONE.

SCHMELEW (310) instilled into the eyes of rabbits (the right eye being previously cocainized) equal quantities of eserin or atropin solutions, with the result that the action of the respective drugs appeared earlier and with greater intensity in the right eye than in the left. Directly afterward the aqueous was carefully withdrawn from the posterior segment of the eye with a syringe, and instilled into the eyes of other animals, the aqueous of the right eye into the right eye of the experimental rabbits, and that of the left into the left eye. Thereupon the action of the eserin or atropin regularly appeared more quickly and more actively in the right eye. Hence the author concludes that the aqueous of the *cocainized* eye invariably contained more eserin or atropin (as the case may be), than in the left eye.

Fluorescin tests gave the same result. The author concludes that the absorption from the conjunctival sac is more rapid in the cocainized eye. HIRSCHMANN.

BERRY (311) affirms, that the theories of color-perception do not explain the physiological color-blindness of the peripheral

portions of the retina, nor acquired color-blindness. He adds, that the defect does not lie in the retina, but in the central organ.

WERNER.

STADERINI (312) has made careful investigations concerning the excretory passages of the aqueous. He operated mostly with India ink, the finest carmine, and a Pravaz syringe. The best results were secured by the use of the India ink. He comes to the conclusion that Schwalbe-Waldeyer's opinion, that there is an open connection between the anterior chamber and the blood-vessels, is decidedly erroneous. Fontana's canal contains anatomical arrangements and physical conditions which assist and abundantly secure under normal conditions the outflow of the aqueous by filtration into the venous blood-vessels at the margin of the cornea.

Nor can we deny that the iris takes part in the resorption of corpuscular elements from the anterior chamber. Finally he was able to prove, that physostigmin greatly hastens resorption from the anterior chamber, whilst atropin retards it.

GREEF (314) experimented with an apparatus modified somewhat from Hering's. He was able to decide that the perception of depth is correct at every distance, just as well when we converge with unarmed eyes upon the point, as when the visual axes are made parallel by prisms. So long as the prisms could be overcome by divergence of the eyes, the result remained the same, *i.e.*, the answers were correct.

2. The falling test, at distances in which convergence and accommodation are no longer to be considered, is still possible so long as the balls are visible, and the difference in depth of the two balls is sufficiently large.

3. When one eye had less vision than the other, binocular vision was still present so long as the defective eye possessed a vision of from $\frac{6}{12}$ to $\frac{6}{18}$.

4. Binocular vision is never seen in squinters, either before or after the operation.

The author objects (315) to examinations: 1. With colored lights, because we cannot obtain varying atmospheric conditions. 2. Holmgren's test is erroneous, because founded on the Young-Helmholtz theory. If partially red and green blind are rejected, many competent persons would be rejected. If only the completely red and green blind are rejected, many incompetent men will pass.

WERNER.

Sections VI.–XI. Review by PROF. C. HORSTMANN.

VI.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

316. FERDINANDS. Investigations into the eyesight of children attending some of the Aberdeenshire Board schools. *Brit. Med. Jour.*, Sept., 1891, p. 585.

317. GOULD. Statistics and results of 1,500 cases of refraction. *Jour. Am. Med. Ass.*, Sept. 19, 1891.

318. RAMOS. Errors of refraction in Mexico, compared with those of Europe. *Verhandl. d. X. Int. med. Cong.*, 1890, iv., p. 79.

319. JAVAL. On the heredity of myopia. *France méd.*, 1891, No. 34, p. 536.

320. VACHER. Treatment of progressive myopia and prophylaxis of detachment of the retina, by extraction of the transparent lens. *Soc. d'opht. de Paris*, Nov. 3, 1891.

321. BRISTOWE. The opthalmoscopic appearances of hypermetropia and their significance. *Ophthal. Rev.*, p. 321 ; and *Brit. Med. Jour.*, Sept., 1891, p. 591.

322. DE SCHWEINITZ. One hundred cases of stigmatism against the rule and the associated symptoms. *Jour. Amer. Med. Ass.*, Sept. 5, 1891.

323. CHISOLM. The value of weak cylinders in the cure of spasm of the ocular muscles. *Jour. Am. Med. Ass.*, Sept. 12, 1891.

324. SAVAGE. The harmonic, symmetrical action of the obliqui, in all cases of oblique astigmatism. *Ophthal. Rec.*, July, 1891.

325. BERRY. On some points with reference to the connection between accommodation and convergence. *Trans. Ophthal. Soc.*, U. K., xi., p. 156.

326. BURNETT, S. M. Further contributions to keratometry. *Jour. Amer. Med. Assoc.*, Sept. 5, 1891.

327. BURNETT, S. M. The prism dioptry *vs.* the centrad. *Jour. Amer. Med. Assoc.*, Aug. 10, 1891.

328. CHISOLM. Homatropia in refractive cases. *Amer. Jour. Ophthal.*, July–Aug., 1891.

329. JACKSON. The full correction of ametropia. *Jour. Amer. Med. Assoc.*, Sept. 2, 1891.

330. MITTENDORF. One thousand cases of ocular headache and the different states of refraction connected therewith. *Med. Rec.*, July 18, 1891.

331. RANDALL. The reformed numeration of prism and the centrad as a unit. *Jour. Amer. Med. Assoc.*, Aug. 29, 1891.

332. STARKEY. An experimental study of the comparative mydriatic effect of atropia and homatropia. *Jour. Amer. Med. Assoc.*, Sept. 16, 1891.

333. VAN FLEET. The normal refraction of the eye. *N. Y. Med. Rec.*, Dec. 5, 1891.

FERDINANDS (316) examined the refraction of 3,000 school children in the erect image and with Snellen's type. No child was under 7 years of age. Four hundred and four myopes and 498 hypermetropes were found. The bad types of myopia prevailed in the lower schools, and in the higher schools the percentage of myopia increased. There were very few myopes in the country schools. The degree of hypermetropia increased with the age. In the children of 7 years, the myopia varied between 1 and 5 D. WERNER.

GOULD (317) has tabulated 1,500 cases of refraction with exception of cases of pure presbyopia ; all of the determinations of refraction were made under atropine. More than a third of all hyperopes, or a fourth of the eyes, exhibited a defect of 0.5D or more. He *undercorrects* all forms of refraction, and is especially polemical against the full correction of myopia. He has never seen a case of heterophoria independent of ametropia of some sort, and he recommends tenotomy only when the degree is more than 12°. BURNETT.

RAMOS (318) found in 2,000 Mexican school children, 88 cases of myopia, 60 of hypermetropia, and 10 of astigmatism. He thinks that the ethnological influence plays a great part in the development, and increase of myopia. Pure Mexicans rarely show any defect of refraction, though it occurs in the mixed races, but very rarely in comparison with its frequency amongst Europeans.

According to Javal (319) myopia is not hereditary, only the disposition thereto. Astigmatism is hereditary and must be corrected early, because, if not corrected, the work has to be brought close to the eye, and myopia is excited.

MARCKWORT.

VACHER (320), having operated seven times by extraction of the transparent lens in high progressive myopia, recommends it generally. It is his opinion, that the operation stops the advances of the myopia, and tends to prevent subsequent detachment of the retina. Wecker and Galezowski, in the discussion, remarked that there was no theory according to which the operation would help to prevent the progress of the myopia, to say nothing of acting as prophylaxis against a future detachment. On the contrary, the eye was much more likely to suffer from a detachment after the lens was removed than when it was *in situ*. In order to show that the extraction did not prevent the progress of the myopia, a patient was introduced by Wecker, in whose eyes discission of a congenital cataract had been performed. He was gradually obliged to reduce the strength of his convex glasses, so that he no longer needed them for distance, and for near used + 2 D, a decided proof that the myopia had advanced despite the removal of the lens. MARCKWORT.

BRISTOWE (321) examined 225 cases of hypermetropia, in 71 of which the fundus was normal. In 29 there was a pseudo-retinitis, or a so-called hypermetropic papilla; 15 times the retina appeared watery and shining. A concentric striation near the papilla was observed in 9 cases, all of which were in children. WERNER.

DE SCHWEINITZ (322) reports 100 cases of astigmatism against the rule, from which we learn that the symptoms are worse or different from those of other forms of ametropia. He believes, however, that the astigmatism should never be completely corrected, even in the lowest degrees. BURNETT.

CHISOLM (323) believes that headache, on using the eyes when the vision is good, indicates astigmatism. In every case of asthenopia with normal vision he prescribes the proper cylinder, with axis against the rule, and finds relief. BURNETT.

SAVAGE (324) renews his assertion of four years since, that in astigmatism the oblique muscles endeavor to unite the oblique meridians with the horizontal and vertical. This takes place by the so-called harmonic, symmetrical action of the obliqui. The work is illustrated with sketches intended to represent the author's idea of how this takes place. BURNETT.

BERRY (325) tested the latent position of the eyes at various distances. The axes in emmetropia, for a distance, are mostly parallel. Divergence is rarer than convergence. In myopia, parallelism is less frequent. Divergence and convergence are observed with the same frequency, but, on the whole, more slight

degrees of divergence. In hypermetropia, parallelism is as often seen as in emmetropia, but latent convergence is more frequent. Correction of the refraction has but little influence upon the latent position for distance. In cases of exertion of the accommodation, the divergence is slightly increased or the convergence diminished by the use of concave lenses, but not in proportion to the exertion of the accommodation. WERNER.

BURNETT (326) advocates the prism dioptry as proposed by Prentice, in the numbering of prisms, and points out its superiority to the centrad system.

BURNETT (327) confirms his formerly expressed opinion of the great practical value of the ophthalmometer of Javal in the determination of astigmatism, and reports some cases of changes in the form of the cornea due to inflammatory disease.

CHISOLM (328) has found homatropia most satisfactory in producing paralysis of accommodation in refractive cases. He uses it six grains to one ounce of water. BURNETT.

JACKSON (329) claims that all forms of ametropia, including myopia, should be corrected in full, except in some very special cases. BURNETT.

MITTENDORF (330) found that in 1,000 cases of asthenopia, 2 % had m.; comp. m. astig., 1 %; simpl. m. astigmatism, 10 %; h. 8 %; h., with presbyopia, 3.5 %; comp. h. astig., 7 %; simple h. astig., nearly two thirds of the whole number; anisometropia, 3 %; mixed astig., 2 % = emmetropia with muscular faults, 1 %. He uses weak cylinders very often, the 0.25 D in many cases giving relief to pronounced asthenopia. BURNETT.

RANDALL (331) points out the need of a revision in our methods of numbering prisms, and advocates the centrad, proposed by Dr. Dennett as a unit. BURNETT.

What STARKEY (332) really studied and reported upon was not the mydriatic effect of homatropine and atropine, but their power of paralyzing the accommodation, and from the 25 cases tabulated it would seem that for this purpose homatropine is quite as reliable as atropine. The homatropine was a one-per-cent. solution, instilled every five minutes for fifty minutes. BURNETT.

VAN FLEET (333) concludes from a study of numerous statistics that there are only two refractive conditions of the eye, viz.: hypermetropia, or the normal; and myopia, the abnormal. Emmetropia, as generally understood, has no existence, except as a beginning of myopia.

VII.—LIDS.

334. WAGNER. Rodent ulcer of the eyelids. *Wjest. Ophthal.*, 1891, No. 3, p. 214.

335. SCHAPRINGER. A second case of vaccine blepharitis, *N. Y. Med. Monthly*, Nov., 1891.

336. VALUDE. Epithelioma of the inner angle of the eyelids. *Arch. d'opht.*, xi., 5, p. 439. BENNETT.

337. LAGRANGE. Melanosarcoma of the lids. *Rec. d'opht.*, No. 6, p. 328, 1891.

338. MOAURO. Granuloma of Moll's glands. *Ann. d'Ottal.*, xx., 4, p. 324.

339. CARL THEODOR, Duke of Bavaria. A case of cornu cutaneum of the right superior eyelid. *Festsch. Helmholtz*, 1891.

340. MINNEY. Transplantation in minor degrees of entropium. *Ophth. Rec.*, 1891, Part i, p. 34.

341. WAGNER. The operation of entropium. *Wjestnik. Ophthal.*, 1892, 3, p. 214.

342. BLICKHAHN. A case of chancre of the right upper lid. *Amer. Jour. Ophthal.*, July–August., 1891.

WAGNER (334) calls as a rodent ulcer of the eyelids, a peculiar form of ulceration appearing at the palpebral portion of the conjunctiva, and rapidly increasing in depth and extent, which he has seen twelve times, and for which he recommends careful cauterization of the floor with a 75-per-cent. solution of acetic acid.

SCHAPRINGER (335) reports a fourth case of vaccine pustules on the lids, the result of infection, which he has lately seen. The case was that of a man of forty-two, with two pustules on the lower lid, accompanied with a superficial ulceration of the cornea.

BURNETT.

VALUDE (336) emphasizes the extreme malignancy of certain cancroids at the inner angle of the eye. Whilst those on the lids or at the outer angle have but little tendency to extend deeply, those at the inner angle not infrequently do so extend into the tear-sac and passage. The treatment must be operative, and demands that the tissues be freely opened. In order to see that there is no relapse, it is better not to cover with an early flap. If we wait, the flap may be made much smaller. It is worth noting that the tumors removed proved to be cylindromata.

v. MITTELSTÄDT.

LAGRANGE (337) describes a melanotic sarcoma of the left eyelid after an old injury. The tumor lay between the cartilage and the skin, was as large as a nut, and six months later showed no traces of a relapse. MARCKWORT.

MOAURO (338) gives the anatomical description of a small lid-tumor, which proved to be a granuloma of Moll's glands, with giant cells. DANTONE.

CARL THEODOR (339) removed from the upper lid of a woman of seventy-eight a cuticular horn which arose from the outer and middle third. The microscopical condition resembled that of an ordinary wart of the skin.

MINNEV (340) transplants from the forearm in cases of partial entropium, to fill out the space left open by the retraction of the skin after the portion containing the reversed eyelashes is wholly loosened. He holds to the most modern rules in regard to transplantation of skin, and does not use any sutures for fixing the portion transplanted. BURNETT.

WAGNER (341) operated according to Pfalz's suggestion in 32 cases of entropium and trichiasis, in which the intermarginal space was lost, and the hairs grew from the sharpened eyelids as well as in cases of relapse after other methods. He had good results in all of these cases, and at the end of the year no relapses. HIRSCHMANN.

The patient of BLICKHAHN (342) was from Alt's clinique, and had a sore on the penis which was phagedenic. Soon after the appearance of this, a lump was discovered on the right upper lid, and that eye was red. The diagnosis of hordeolum was first made, but when it was at last laid open it was found to be an ulcer which was also phagedenic. It was cauterized with nitric acid, and the case as a whole treated antisyphilitically, and he recovered. BURNETT.

VIII.—LACHRYMAL APPARATUS.

343. FUCHS. Simultaneous affection of the lachrymal and parotid glands. *Beiträge z. Augenheilk.*, 1891, part 3.

344. v. SCHROEDER. A case of acute dacryoadenitis in epidemic parotitis. *Zehender's Monatsbl.*, vol. xxix., p. 404.

345. GUTMANN. Acute double dacryoadenitis. *Verhandl. d' X. Int. Med. Cong.*, 1890, vol. vi., No. 10, p. 159.

346. DE WECKER and MASSELON. Symmetrical tumors of the

lachrymal, palpebral, and parotid glands. *Soc. d'opht. de Paris*, Dec. 1, 1891.

347. TROUSSEAU. Fluxion of the lachrymal gland. *Soc. d'opht. de Paris*, June 2, 1892.

348. TERSON. Report on the treatment of affections of the lachrymal passages. *Cong. franç d'opht.*, May 4, 1891.

349. GUAITA. Operative treatment for the rapid cure of dacryocystitis. *Annal. d'Ottal.*, vol. xx., No. 5, p. 375.

350. DESPAGNET. Curettage of the lachrymal sac. *Rec. d'opht.*, 1891, p. 275.

351. DE WECKER. Scraping of the lachrymal sac. *Arch. d'opht.*, vol. xi., No. 6, p. 492.

352. PETERS. On the so-called lachrymal blennorrhœa of infants. *Zehender's Monatsbl.*, vol. xxix., p. 376.

353. CROSS. Blood-stained tears. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 312.

354. WILMER. A new lachrymal drill. *Medical Rec.*, Sept. 26, 1891.

According to FUCHS (343) double disease of the lachrymal glands may make its appearance as a swelling, either acute or chronic. Acute swelling of the tear-glands and of the parotid is seen in mumps. Chronic swelling of the lachrymal and various salivary glands are caused by lymphoma and lymphosarcoma, then follows chronic swelling of the lymphatic glands of the head and neck.

A woman of twenty-seven was affected according to SCHROEDER (344) with double parotitis and dacryoadenitis. The swelling departed in a fortnight after the constant use of warm borated fomentations.

GUTMANN (345) reports two cases of acute dacryoadenitis following a case of gonorrhœa of long standing.

DE WECKER and MASSELON (346) describe a case of tumor of both lachrymal and both parotid glands. The palpebral portion of the lachrymal gland was removed. The preparations were examined by Lateaux, and proved to be an epithelial tumor of the gland. The operation was performed in September, and by December the patient was cured. Kalt believes that the drawings of the tumor resemble lymphoma. MARCKWORT.

TROUSSEAU (347) saw with his own eyes the region near the

lachrymal gland suddenly swell inside of two hours to an enormous size, as the result of mental shock or of intense illumination, or of bit of dust flying into the eye. Suddenly there would be a gush of tears, and the swelling would at once disappear.

MARCKWORT.

GUAITA's (349) new operation for chronic inflammation of the lachrymal sac consists in splitting open the sac in the old fashion, then in scraping the walls with a sharp spoon, next in probing the nasal portion, and finally in inserting into the latter a decalcified turtle's thigh bone. The idea is, that the bone shall carry off the exudation in the sac and finally be absorbed. The author has performed the operation 31 times successfully. The recovery is very rapid. DANTONE.

DESPAGNET (350) acts as follows in cases of closure of the lachrymal duct and sac: The sac is split open externally, and if very much swollen, a portion of the anterior wall is removed. After evacuation of the sac and syringing with sublimate (1-1000) it is energetically scraped with the sharp spoon. Large and projecting granulations are abscised with the scissors. Finally the walls of the sac are washed with a solution of sublimate in glycerine (1-2000) and a light pressure bandage is applied. The swabbing with the sublimate-glycerine is continued until the external wall closes, or for about ten days. The treatment concludes with a few instillations through the lachrymal canaliculi.

MARCKWORT.

DE WECKER (351) recommends scraping of the sac instead of extirpation or obliteration. After splitting the upper punctum and canaliculus as far as the caruncle, a sharp bistoury is passed into the lachrymal sac, and by turning the blade forward, and simultaneous tension on the external commissure, the anterior wall of the sac is split about 1 *cm* in length. After abundantly sprinkling the sac with sublimate (1-4000), the mucosa is freely scraped with a sharp spoon, and after the hemorrhage has ceased the incision is sutured and a bandage applied. The incision generally unites in three or four days, even if the operation were done at the height of the inflammation. The operation is indicated in cataractous patients in whom we desire to stop the suppuration rapidly and in patients belonging to the working classes or who live far from a specialist. v. MITTLESTÄDT.

According to PETERS (352) there is a class of cases of so-called blennorrhœa of the sac in infants and children which are not due to

any disease of the mucosa, and do not deserve the name of a blennorrhœa. The real trouble is a defective resorption of the tissue at the orifice of the canaliculi and retarded escape of the material in the hollow of the canaliculus. In other words, there is a genuine atresia of the lachrymal punctum or canaliculus. In such cases we have only to press out the sac or thoroughly cleanse the eyes to bring about a rapid cure. There is no need of syringing the tear sac or of the application of astringents to the conjunctiva.

Cross' (353) patient was a woman of twenty-one, rather anæmic, but healthy otherwise and free from hysteria. The vision was normal, and there was only a slight follicular catarrh. The left eye occasionally evacuated bloody tears. When the eyes were closed there would be found a small coagulum under the upper lid. This condition persisted without any amelioration. There was no tendency to epistaxis or philhæmia. WERNER.

Wilmer (354) has devised a steel drill with a protecting canula, which he uses for opening up bony occlusions of the nasal duct. He reports one case of its satisfactory use. BURNETT.

IX.—MUSCLES AND NERVES.

355. Roberts. Topographical anatomy of the external angle of the eye, from the point of view of strabotomy. *Arch. d'opht.*, vol. xi., No., p. 435.

356. Berry. Note on the individual differences in the degrees of latent lateral deviations of the eye on looking upward and downward. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 170.

357. Parinaud. General considerations on strabismus. The innervation of convergence. *Ann. d'Ocul.*, vol. cvi., p. 161.

358. Parinaud. Ætiology of convergent strabismus. *Ann. d'Ocul.*, vol. cvi., p. 321.

359. Juler. The operative treatment of strabismus. *Brit. Med. Jour.*, Sept., 1891, p. 590.

360. Bronner. Fifty cases of strabismus in which the rectus muscle was advanced according to the method of Schweigger. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 143.

361. Wray. Suggested technique to prevent strain on the supra- and infra-corneal sutures during the re-attachment of the advanced muscles. *Ophth. Rev.*, vol. x., p. 328.

362. ARGYLL-ROBERTSON. On a modification of the ordinary method of operating for advancement of the tendon of the rectus muscles. *Brit. Med. Jour.*, Aug., 1891, p. 471.

363. WILLIAMS. Modification of the ordinary operation for the advancement of the tendon of the rectus muscles. *Brit. Med. Jour.*, Sept., 1891, p. 574.

364. FERNANDEZ SANTOS. Spontaneous disappearance of an accident of strabotomy; exophthalmos. *Ann. d'Ocul.*, vol. cvi., p. 18.

365. COLLINS and WILDE. The pathology of the ophthalmoplegiæ. *Brit. Med. Jour.*, Aug., 1891, p. 474.

366. THOMPSON. Miner's nystagmus among the South Wales colliers. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., July, p. 87.

367. SNELL. On miner's nystagmus. *Brit. Med. Jour.*, July, 1891, p. 61.

368. DRANSART. Miner's nystagmus in the north of France. *Cong. franç. d'opht.*, May 5, 1891.

369. SNELL. Case of nystagmus in a compositor. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 103.

370. MORTON. Bilateral paralysis of external recti following diphtheria. *Trans. Ophth. Soc. Unit. King.*, vol. xi., p. 107.

371. WUERDEMANN. Fibro-sarcoma of the neck with temporary opthalmoplegia externa and sympathetic paralysis. *Jour. Amer. Med. Assoc.*, Sept. 26, 1891.

ROBERTS (355) explains the relations of Tenon's capsule and its connections with the globe, the tendon of the external rectus muscle, and the ligamentum palpebrale. v. MITTELSTÄDT.

BERRY (356) tested fifty cases in regard to the degree of lateral divergence in gazing upward and downward, and found in nine the convergence the same in looking both upward or downward; in twenty-eight, the convergence was greater on looking downward, and in the remaining thirteen it was greater when looking upward. WERNER.

According to PARINAUD (357) there is an especial innervation of the eye muscles for convergence. The relations between the convergence and the accommodation are maintained by this innervation. MARCKWORT.

PARINAUD (358) affirms that the theory of congenital muscular insufficiency rests upon an error. That which others call insuffi-

ciency of the interni, Parinaud, in unison with Krenchel and Hansen Grut, call insufficiency of the innervation of convergence. The good results from the use of prisms with the base inward militates against the muscular insufficiency theory.

MARCKWORT.

JULER (359) describes 174 squint operations. He operates on children, no matter at what age, if the strabismus is actually permanent. In all cases of amblyopia, he combines the advancement of the antagonist with the division of the opposite tendon.

WERNER.

BRONNER (360) carries the suture through the superficial layers of the sclera near the cornea. He tenotomizes both interni, in case the deviation measures from 25° to 40°, in case there is no amblyopia, and makes the double tenotomy with advancement if the deviation is more than 40°. He does advancement alone, with a deviation of 30° and amblyopia; and finally advancement and tenotomy in squint above 30°.

In advancement WRAY (361) uses a third suture between the infra- and supra-corneal suture, which unites the tendon hanging on the globe to the posterior portion of the muscle.

WERNER.

In advancement of the recti, ROBERTSON (362) passes the suture with two needles through the tendon to be advanced, and then pushes the needles through the conjunctiva, the one above and the other below the cornea. WERNER.

WILLIAMS (363) claims priority in the preceding operation.

WERNER.

SANTOS FERNANDEZ (364) reports a case of exophthalmos after an operation for squint. The operation had passed off well in a youth of seventeen, excepting that, owing to the narcosis, there was much emesis with subconjunctival hemorrhage. On the following day, convergence in the operated eye had ceased, and instead a corresponding diplopia existed. Twelve days later the diplopia had disappeared, and the motions of the eyeball were normal. Two months later, exophthalmos ensued, and persisted for eight years, when it again disappeared, and did not return.

MARCKWORT.

COLLINS and WILDE (365) subdivide the ophthalmoplegiæ into cortical, basal, and orbital. The cortical are to be divided further into the genuine cortical, the cortical peduncular, the nuclear, and radicular. The basal are divided into those arising

from the region of the pons, the pedunculi, the sinus cavernosus, and the fissura sphenoidalis. The authors report 141 cases, of which 73 were men. The cause in 30 % was syphilis. WERNER.

THOMPSON (366) is of the opinion that nystagmus in miners is due to the poor illumination. Over-exertion as well as errors of refraction may increase the predisposition to nystagmus. WERNER.

According to SNELL (367) miners' nystagmus is due to the constrained position of the workmen. The light has but little to do with the defect. WERNER.

DRANSART (368) discusses miners' nystagmus. There is a slight and a severe form. The slight is only seen directly after working in the mine. The severe is accompanied with functional disturbances, especially paresis of accommodation. Of 100 patients with this disease in its most severe form, 90 worked in a recumbent position in passages less than 1*m* in height. MARCKWORT.

SNELL (369) watched the appearances of nystagmus in a type-setter of twenty-one, who had for several months worked a long time by night. Snell believes that the nystagmus is the result of the continuous looking from the manuscript to the type and back. WERNER.

MORTON (370) records three cases of paralysis of the externi after diphtheria, occurring five, four, seven weeks respectively after the sore-throat. In one case there was also defective action of internal and superior rectus. Pupils acted to light and convergence in all cases; the accommodation was affected in two. Loss of the patellar reflex in all three. A fourth case is recorded in a child of five. In all the cases the loss of the patellar reflex continued after other symptoms had disappeared. WERNER.

In WUERDEMANN'S (371) case, a boy of fourteen had a large swelling on the right side of the neck, which on microscopic examination was decided to be a fibro-sarcoma. There was, when Wuerdemann first saw him, ptosis and paralysis of the internal rectus on the same side. The pupil was contracted, and did not respond to light. There was some slight tortuosity of the retinal veins. $S = \frac{6}{12}$. Under hot baths and rest, these symptoms disappeared, and the vision was increased to normal. The tumor has not been interfered with. BURNETT.

X.—ORBIT AND NEIGHBORING CAVITIES.

372. AXENFELD. On the development of lymphoma in the orbit. *v. Graefe's Arch.*, iv., xxxvii., part 4., p. 102.

373. Collins. On a case of tumor in each orbit; death, Necropsy. *Royal Lond. Ophthl. Hosp.*, rep. xiii., p. 245.

374. Sgrosso. Contribution to the casuistic of osteoma of the orbit. *Naples Pasquali*, 1891.

375. Pooley. Intraorbital cyst, probably of a dermoid nature. *Ophthal. Rec.*, 1891.

376. Williams, R. A case of arterio-venous anastomosis communication in the orbit. *Trans. Oph. Soc. Unit. Kingd.* xi., p. 32.

377. Le Fort. Pulsating exophthalmus, *a propos* of a case of ligation of the two carotids for this disease. *Rev. Chirurg.*, x., pp. 369, 457.

378. Israel. Pulsating exophthalmus. *Deutsch. Med. Wochensch.*, 1891, No. 51.

379. Phillipen. Note on a case of pulsating exophthalmus in a new born child. *Ann. d'Ocul.*, cvi., p. 420.

380. Cheney. A case of retraction of the eyeball. *N. Y. Med. Rec.*, 1891, Nov. 7.

381. Lamy. Exophthalmic goitre. *Mercredi. Med.*, 1891, No. 12. p. 141.

382. Sharkey. On Graefe's lid-sign. *Trans. Ophthal. Soc. Unit. Kingd.*, xi., p. 304.

383. Bull, C. S. Tumors of the orbit, secondary or consecutive to tumors of the neighboring bony cavities. *N. Y. Med. Jour.*, 1891, Dec. 19.

384. Lawford. A case of recovery from Graves' disease. *Trans. Ophth. Soc., Unit. Kingd.*, xi., p. 211.

Axenfeld (372) reports the case of a man of sixty-two from whose eyelids four small lymphomata had been removed. Two months later exophthalmus appeared, originating from a growth in the orbit. There were simultaneous enlargements in other parts of the body, and in the neck. The largest portion of the tumor lay to the left beneath the external half of the orbital roof near the lachrymal gland. It was extirpated with preservation of the globe, and proved to be a lymphoma. After several months the patient returned with the tumor enormously enlarged. Arsenic was administered, and later the tumor decreased in size.

Collins' patient (373) was fifteen months old, with tumors in both orbits, histologically resembling the tissue of the lymphatics.

General symptoms ensued shortly before death. The internal lymphatics were enlarged, but not the externals. WERNER.

SGROSSO (374) reports the successful removal of a spongy osseous tumor on the inner orbital wall. The globe and vision were preserved. DANTONE.

POOLEY'S patient (375) was a man of twenty-three, who had noticed on his left upper lid for more than ten years a small tumor. A soft fluctuating tumor was discovered in the orbit just over the superior rectus. An attempt was made to enucleate it through the retro-tarsal fold, but it simply evacuated itself. As it continued to fill and evacuate in turn an attempt was made to enucleate it through the skin. This also miscarried, the tumor collapsed as before, and its walls could no longer be determined. A drainage tube was inserted, and the sac regularly syringed with sublimate. This treatment finally produced a cure. The globe was not affected. From the nature of the contents Pooley is of the opinion that the tumor belonged to the dermoid group. BURNETT.

WILLIAMS' patient (376), a boy of fourteen, exhibited well-pronounced proptosis with pulsating tumor and aneurismic murmur. The refracting media were transparent, the vision was $\frac{1}{15}$, the papilla was normal, the veins enlarged and tortuous. Cure, after ligation of the common carotid. Ptosis and contraction of the lids remained. The veins appeared unaltered. WERNER.

ISRAEL (378) tells of a patient with pulsating exophthalmus which was caused by a retrobulbar cavernoma.

PHILLIPEN (379) saw in a new-born child a unilateral exophthalmus which was observed by the parents a few days after the birth of the child. The eye deviated 1*cm* downward. The movements upward were limited. There was a small, slightly fluctuating tumor between the upper orbital wall and the globe. Under expectant treatment the exophthalmus disappeared in a few months. The author believes that a subperiosteal hemorrhage at birth, and situated on the upper orbital wall, was the cause of this peculiar case of exophthalmus. MARCKWORT.

CHENEY (380) reports a case of retraction of the globe, in which there was probably an ophthalmoplegia externa, in which the lateral muscles of the right eye were chiefly affected. When convergence is attempted the eye falls from 3 to 4 *mm* into the orbit. Vision normal after improvement of a slight ametropia. The retraction, according to the author, is due to the action of the

inferior and superior recti, which exert themselves to support that of the internus in convergence. BURNETT.

SHARKEY (382) tested 613 patients and found in 12 the well-pronounced v. Graefe phenomenon. In only one of these he found an undoubted case of Basedow's disease. He is of the opinion that the phenomenon in question can no longer be regarded as a diagnostic point in the detection of the disease. It is actually due to weariness of the orbicularis. WERNER.

BULL (383) considers in succession the tumors of the sphenoid, ethmoid, frontal sinus, and maxillary antrum, which are likely to affect the orbit. The subject is treated in a general manner, and no cases are given. BURNETT.

XI. — CONJUNCTIVA, CORNEA, SCLERA, AND ANTERIOR CHAMBER.

384. CHIBRET. Pathogeny of affections of the conjunctiva in a bacteriological point of view. *Cong. franç. d'Ophthal.*, 1891, May.

385. MUTTERMILCH. Anatomy of the chronic inflammations of the conjunctiva. *Soc. d'Ophthal.*, Paris, 1891.

386. VALUDE. Anatomy of the chronic inflammations of the conjunctiva. *Ann. d'Ocul.*, cvi., p. 241.

387. HOLMES-SPICER. An analysis of 158 cases of acute purulent ophthalmia. *Royal London Ophthal. Hosp.*, rep. xiii., p. 221.

388. VALUDE. Prophylaxis of the ophthalmia of the newborn by the use of pulverized iodoform. *Ann. d'Ocul.*, cvi., p. 96.

389. NIEDEN. On a case of blennorrhœic conjunctivitis in a child born in the membranes. *Zehender's Monatsbl.*, xxix., p. 353.

390. DE SCHWEINITZ. A case of persistent hemorrhage from the conjunctiva of an infant, following the instillation of a solution of nitrate of silver. *N. Y. Med. Rec.*, 1891, April 18.

391. OATMAN. The treatment of diphtheritic conjunctivitis by constant antiseptic irrigations. *Med. Rec.* 1891, Oct. 10.

392. HODGES. Iodide of silver in the treatment of trachoma. *Ophthal. Rec.*, vol. i., No. 3, p. 84.

393. SCOTT. Perchloride of mercury in the curative treatment of trachoma and other conjunctival diseases. *Trans. Ophth. Soc. Unit. Kingd.*, xi., p. 39.

394. DARIER. Presentation of cases in which brossage had been performed. *Soc. d'Ophthal. de Paris*, 1891, July 7.

395. MARPLE. Grattage for trachoma. *N. Y. Med. Record*, 1891, No. 28.

396. MANOLESCU. Brushing of conjunctival granulations combined with parasiticides. Constantinople, 1891.

397. WEEKS. Surgical treatment of granular eyelids. *N. Y. Med. Jour.*, 1892, No. 17, p. 451.

398. KEYSER. Conjunctivitis granulosa. Pumice stone. *Ophthal. Record*, i., p. 8.

399. SMITH, E. A new method for operating on frog-spawn-like oculo-palpebral folds. *Ophthal. Rec.*, i., No. 8.

400. COUÉTOUX. On kerato-conjunctivitis of rhino-pharyngeal origin. *Ann. d'Ocul.*, cvi., p. 401.

401. GASPERINI. Diffuse lymphoma of the conjunctiva. *Ann. d'Ottal.*, xx., 4, p. 356.

402. CRITCHETT and JULER. Epithelioma of the cornea and conjunctiva. *Trans. Ophth. Soc. Unit. Kingd.*, xi., p. 47.

403. SAJESCHKO. Clinical contributions to the question of transplantation of conjunctiva. *Wjestnik. Ophth.*, 1891, Nos. 4 and 5, p. 299, and No. 6, p. 471.

404. BURNETT, S. M. Recent views on the pathology of trachoma. *Ophthal. Rec.*, Sept., 1891.

405. CHEATHAM. Trachoma and its treatment. *Ophthal. Rec.*, Aug., 1891.

406. DE SCHWEINITZ. A note on fluorescin coloring, and the actual cautery in corneal ulcers. *Med. News*, Aug. 15, 1891.

407. FELLOWS. Ocular Massage. *Jour. Ophthal., Otol., and Laryngol.*, July, 1891.

408. FULTON. Pathology and ætiology of trachoma. *Ophthal. Rec.*, Aug., 1891.

409. THOMPSON, J. T. Emphysema of the conjunctiva. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 122.

410. DUNN. Some remarks upon the ætiology and treatment of the phlyctenular eye diseases. *N. Y. Med. Jour.*, Sept. 19, 1891.

CHIBRET (384) describes the various conjunctival affections from a bacteriological standpoint. In the first part the conjunctiva

is discussed in a healthy and diseased condition as a soil for bacilli. In the second, the various species of bacilli, and the diseases that they cause. Panas, in the discussion, thinks that there is a malignant form of blennorrhœa neonatorum, in which we find the gonococcus, and a benign form in which a bacillus, studied by Weeks, is discovered. In Coppez' opinion, follicular and granular conjunctivitis are identical.

Holmes-Spicer (387) studied 158 cases of purulent ophthalmia (exclusive of ophthalmia neonatorum), amongst which were 126 men; 111 men, and 16 women were infected from the gonorrhœal secretion. Perfect restoration, or with but little injury, occurred in 110 cases. In every patient older than thirty-eight, with one exception, the eye was lost. Where the gonorrhœa had lasted four months, a cure was every time observed. In 98 cases in which the cornea had become involved, silver nitrate was employed; in 70 %, 55 % of these eyes were destroyed. Gonorrhoic rheumatism was present in 16 cases. In 5 the diseases began with the formation of a membrane. Werner.

Valude (388) recommends the insufflation of iodoform instead of the instillation of silver nitrate as a prophylactic in blennorrhœa neonatorum. After the use of silver nitrate in the Hospital St. Louis, 7 % to 8 % of the children suffered from the blennorrhœa; whilst after the use of iodoform only 5 % were affected. In the Hospital Parnier the prophylactic treatment with the silver showed about 6 % of cases, whilst the iodoform only permitted 2 %. The iodoform should be dusted into the eyes before division of the cord. Marckwort.

Nieden (389) observed a case of blennorrhœa in a new-born child that was enveloped in the membranes. He thinks that the amniotic fluid, owing to diffusion of the membranes, was infected with noxious material, and so excited the inflammation.

Oatman (391) treated a case of violent bilateral diphtheritis of the conjunctiva with canthotomy and incessant instillations of borated liquid for over four days. The result was successful. Burnett.

Hodges (392) recommends iodide of silver in trachoma, and uses it thus: He first passes a solution (4 to 12) of silver nitrate over the lid, and then washes it over with a solution of iodide of potassium (pot. iodide, 8.00; aquæ, 8.00; glycerine, 16.00) whereby a precipitate of iodide of silver is formed. This treatment he has followed successfully for years. Burnett.

SCOTT (393) has had good results from brushing a four-per-cent. solution of mercuric chloride over the ectropionized lid.

BURNETT.

DARIER (394) and Abadie recommend that in granular conjunctivitis the fold should be vigorously brushed under chloroform narcosis. Darier presented to the Soc. d.'Opht. of Paris seven cases alleged to be cured in this manner. Despagnet and Vignes, on the contrary, express themselves to the effect that the society were not unanimously able to convince themselves of the cure. Vignes suggests massage of the granulations with boric acid. Valude and Despagnet speak of the indifferent results in patients who had been brushed in Algiers by Abadie.

MARCKWORT.

MARPLE (395) describes grattage as practised by Darier in Paris, and reports two cases in which the operation was successfully performed. BURNETT.

MANOLESCU (396) again recommends the energetic brushing of granulations. After this has been done, the conjunctiva is irrigated with carbolic acid and sublimate solutions. After the hæmorrhage has ceased, the iodoform salve is applied. A sublimate bandage is renewed for ten days. One hundred and ninty-seven cases have been thus treated, with asserted good results. MARCKWORT.

After a short *résumé* of the various mechanical procedures resorted to for expressing the trachomatous substance from the conjunctiva, WEEKS (397) gives an account of the prevailing grattage, which is used in Abadie's clinique with the accompaniment of a strong aseptic. He reports twenty-one cases, most of which were cured. BURNETT.

In cases of hard and dry granulations, KEYSER (398) employed a piece of fine pumice stone. He has also employed Manolescu's brushing treatment with good results. BURNETT.

SMITH'S (399) method is a sort of squeezing and shelling out. He fixes the fold firmly with a smooth forceps with a long curve, incises the conjunctiva along the margin of the tissue embraced, and then forcibly squeezes out the contents. BURNETT.

COUÉTOUX (400) is of the opinion, that a considerable number of eye diseases are the sequence of diseases of the naso-pharynx. To this cause are especially due all sorts of phlyctenulæ, and vernal conjunctivitis. Adenoid vegetations are the foundation of all. We must treat these if we expect to cure the eye disease. The two characteristics of eye diseases with this ætiology are the

periodicity and the *localization at the margin of the cornea.* Five cases are appended. MARCKWORT.

CRITCHETT and JULER (402) observed in a man of sixty-six an epithelioma of the cornea, where formerly a pterygium had stood. The nodules were hard and cauliflower-looking, about an inch long, and embraced the entire outer circumference of the cornea. The surface was rough but did not bleed. The globe was enucleated and the tumor was discovered to resemble a malignant papilloma. WERNER.

SAPJESCHO'S (403) conclusions are as follows: That mucous membranes taken from animals do indeed heal in transplantation, but they sooner or later atrophy, as we can always observe by following the case long enough. Human mucosas heal nicely, when transplanted upon the eye. The mucosa of the mouth well supplies the place of the conjunctival mucosa. The successful introduction of a bit of mucosa into the split margin of the lid, is in the author's opinion the best cure in trichiasis and entropium. The lid must be split throughout its entire length for a depth of 5 or 6 *mm.* From the ends of the fissure two vertical incisions embracing the upper fold of the lid, and 3 to 4 *mm* long must be made in order that the opening may be covered over, and not left like a pocket. Total loss of the conjunctiva in symblepharon, xerosis, and hopeless cases of trachoma can be successfully replaced by mucosa from the mouth. The permanent effect is seen here as in other cases of transplantation in from one to two months.

BURNETT (404) thinks trachoma the manifestation of a dyscrasia primarily, and asks for a clear differentiation between trachoma and follicular conjunctivitis, which recent histological examinations seem to justify. He thinks the treatment should be constitutional as well as local, and recommends residence in high localities. He also again calls attention to the fact that he pointed out in 1876 that the negro is not liable to the disease, and quotes others as having since made the same observation.

CHEATHAM (405) treats some cases of severe trachoma with pannus, with pulverized jequirity, making from three to six applications. He watches the patient very closely during the jequirity inflammation. BURNETT.

DE SCHWEINITZ (406) has used fluorescin coloring of the cornea as a guide to the application of the actual cautery in serpent and other ulcers with much satisfaction. BURNETT.

FELLOWS (407) has used a gentle massage of the eye for some inflammatory troubles, particularly trachoma, and leucoma of the cornea, and also for simple "weak" eyes, where nothing could be found to account for the asthenopia. BURNETT.

FULTON (408) regards follicular conjunctivitis and trachoma as pathologically the same disease, and believes in the direct contagiousness of both. He recognizes the influence of race in the development of the affection. BURNETT.

THOMPSON'S (409) patient who had been operated on ten or eleven years previously for orbital exostosis, suddenly got emphysema of the conjunctiva and lids whilst blowing his nose. It disappeared in forty-eight hours after using a light pressure bandage. WERNER.

DUNN (410) from a study of phlyctenular diseases, particularly among the negroes, concludes that the origin of the disease can generally be found in the nose and naso-pharynx, and that the treatment should be directed to those parts primarily, and in particular, should adenoid vegetations be removed. BURNETT.

411. CHIBRET. Tincture of iodine in infectious ulcers of the cornea. *Rec. d'Ophth.*, 1891, No. 8, p. 513.

412. SEDAN. A word on the employment of tincture of iodine in ulcers of the cornea. *Rec. d'Ophth.*, No. 12, p. 710.

413. CAPEI. The tincture of iodine in infectious ophthalmia. *Boll. d'Ocul.*, xiii., p. 24.

414. SIMI. The tincture of iodine in infectious ophthalmia. *Boll. d'Ocul.*, xiii., p. 20.

415. SUAREZ DE MENDOZA. Treatment of ulcerations of the cornea with acid in a deliquescent state. *Rec. d'Ophth.*, 1891, No. 8, p. 474.

416. CHEVALLEREAU. Gouty keratitis. *Soc. d'Opht. de Paris*, 1891, March 2.

417. COLLINS. Two cases of staining of the cornea by blood pigment. *Trans. Ophth. Soc. Unit. Kingd.*, xi., p. 43.

418. DUBOIS DE LAVIGERIE. Hyperplastic epithelial plaque of the cornea. *Soc. d'Ophth. de Paris*, Oct. 6, 1891.

419. AYRES, S. C. Papilloma of the cornea. *Ophthal. Rec.*, vol. x., p. 257.

420. VALUDE. Epithelioma of the sclero-corneal limbus, *Soc. d'Ophth. de Paris*, Dec. 1, 1891.

421. Porywajew. Epibulbar sarcoma. *Wjestnik. Ophth.*, Nos. 4 and 5, 1891.

422. Critchett. A case of conical cornea, treated with the galvano-cautery with perforation of the cornea. *Trans. Ophth. Soc. Unit. Kingd.*, vol. xi., p. 150.

423. Silex. Corneal transplantation. *Verhand. d. X. Int. Med. Cong.*, 1890, iv., 10, p. 157.

Chibret (411) is not much pleased with the galvano-caustic treatment of the infectious ulcers. He prefers to touch them with the tincture of iodine, which is applied every day or two by means of cotton. He sees fewer cases of staphyloma of the cornea with this method, and the cornea clears up more by this than by any other treatment. Marckwort.

Sedan (412) reports that he used the tincture of iodine ten years ago in ulcerations of the cornea. Marckwort.

Capei (413) describes two cases of corneal infiltration in which the tincture of iodine produced a decided antiseptic action. Dantone.

Simi (414) reports three cases of purulent keratitis in which the tincture of iodine proved to be an excellent antiseptic. Dantone.

Suarez de Mendoza (415) touches the corneal ulcers with pure, just soluble carbolic acid. At first he treated in this way only the severe cases, in which Sæmisch's operation or the cautery are the usual means employed, but now he uses the acid in the simpler forms. Marckwort.

Chevallereau (416) gives an account of a case of gouty keratitis with irregular white spots, with a diameter of $1\frac{1}{2}$ *mm*, in both eyes on the centres of the cornea. Lateral illumination showed that the spots were situated in the lamina elastica and in the real corneal tissue. A bit of the tissue removed, proved to consist of crystals of urate of soda. The operative removal of the spots had to be abandoned in the fear of increasing the corneal opacity. Marckwort.

Collins' (417) patients were fifty-six and forty years old, with serious injuries of the eyes. There were numerous blotches in the cornea in the form of reflecting granules, which extended through the whole cornea. They were yellowish, not orange. Descemet's membrane showed no abnormity.

Dubois (418) observed a peculiar tumor of the cornea which had been operated on by two physicians. It was situated on the

anterior margin, and measured 4 *mm* in breadth, and 1 *mm* in thickness. It was vascularized but extremely white. Dubois removed the tumor and cauterized the wound energetically with the galvano-cautery. It seemed to be a callosity. Kalt and Gillet de Grandmont were of the opinion that it was a case of epithelioma. MARCKWORT.

After a brief retrospect of the literature of the subject, AYRES (419) gives a clinical history of a case which he calls a papilloma of the cornea. The case was that of a woman of fifty with a tortuosity of the blood-vessels on the outer margin of the cornea for several years. There was also an elevation of the adjacent sclera, which gradually increased and extended to the cornea. The growth was repeatedly removed, but as often returned. When Ayres first saw the patient, the tumor covered the entire surface of the globe, which was finally enuncleated. The examination showed that the tumor consisted of very fine papillæ, which seemed to spring from the anterior portion of the surface of cornea. BURNETT.

VALUDE (420) publishes three cases from which he affirms that the epitheliomata of the limbus corneæ have the exclusive tendency to develop outward, but not toward the interior of the eye. MARCKWORT.

PORYWAJEW (421) describes a tumor which rested upon the medial side of the limbus corneæ of a man of seventy-five, covered the medial half of the cornea, and had slowly developed from a spot of pigment in the course of ten years. The tumor was abscised with scissors, the base scraped with a sharp spoon, and the defect covered with a conjunctival flap. The tumor consisted of a delicate connective-tissue framework, of large round and spindle-shaped cells and of numerous pigment cells. The benignity and slow growth of the epibulbar primary melano-sarcomata induces the author in all cases in which the vision is still satisfactory and even in relapses of the tumor, to remove it rather than to enuncleate the globe. HIRSCHMANN.

SILEX (423) has transplanted, after v. Hippel's method, the cornea of a guinea-pig upon the cornea of a dog, with good results. In nine attempts in man he had but one satisfactory result, in a boy, in whom the sight was increased from $\frac{1}{45}$ to $\frac{1}{15}$.

424. JOHNSTON. Notes of a case in which five eyelashes were carried into the interior chamber through a wound in the cornea,

Removal by an operation. *Trans. Ophthal. Soc. Unit. Kingd.*, vol. vi., p. 124.

425. CLARKE. Eyelash in anterior chamber. *Ibid.*, p. 125.

426. LAWFORD. Eyelashes in the anterior chamber. *Ibid.*, 126.

427. ARGYLL-ROBERTSON. Case of wound of the sclerotic with penetration of eyelashes into the anterior chamber. *Brit. Med. Jour.*, Aug., 1891, p. 473.

428. MCHARDY. Cyst in anterior chamber of aqueous humor. *Trans. Ophthal. Soc. Unit. Kingd.*, vol. xi., p. 53.

429. COLLINS. On the pathology of intraocular cysts. *Royal Lond. Ophth. Hosp. Rep.*, vol. xii., 41.

430. STRAUB. A case of corneal fistula and traumatic astigmatism cured by an operation. *Weekbl. v. Ned. Tydsch. v. Genes.*, 1891, No. 22, p. 740.

In ROBERTSON'S case (427), eyelashes fell into the anterior chamber through an incision in the sclera three *mm* from the corneal margin. They were later extracted. WERNER.

COLLINS (429) describes amongst others, a case of cyst of the cornea. WERNER.

A hussar injured his right eye. Three months later STRAUB (430) discovered a circular cicatrix of the conjunctiva close to the lower margin of the cornea. There was a shiny black spot in the centre of the cicatrix. A little blister filled with fluid, is often seen just above this point. The iris, close to the citratrix, forms a very fine fold in the direction of the black spot. The latter is a defect in the sclera through which the aqueous is constantly filtering beneath the conjunctiva. Hence, the well-marked hypotony. At the operation the cicatrix was split vertically to the margin of the cornea, and the fistula laid bare. It was impossible to suture the minute scleral incision, and therefore a triangular bit of conjunctiva with the base at the corneal margin was removed. After the conjunctiva was sutured, there was a linear cicatrix directly over the defect in the sclera. The cicatrix adhered closely to the sclera, closed the scleral opening, and formed a transparent, white, hard cord in the locality of the fistula. Tension normal. The astigmatism decreased and vision formerly $\frac{1}{3}$ increased to $\frac{1}{1}$. WESTHOFF.

(To be concluded in the next number.)

BOOK REVIEWS.

Diseases of the Eye. A Handbook of Ophthalmic Practice for Students and Practitioners. By G. E. De Schweinitz, M.D., Prof. Philadelphia Polyclinic, Lecturer University of Penn., etc. W. B. Saunders, Philadelphia, 1892.

This text-book is a handsome large octavo volume of 641 pages, very well printed, on good paper, and illustrated with 216 neatly executed drawings in the text, many of which are original, and two chromolithographic plates with seven ophthalmoscopic pictures, all reproductions. The work is conscientiously written, and represents, as far as the limits of a text-book permit, the actual standpoint of practical ophthalmology with remarkable completeness and attention to details. It is a medium between the smaller text-books of Nettleship, Swanzy, Schmidt-Rimpler, and others—so admirable for their conciseness and the strict adaptation to the needs of the student—and the more elaborate treatise of Noyes, Fuchs, Wecker-Masselon, and others, which are more calculated for the special student and practitioner of ophthalmology. De Schweinitz's book may very well be used by the college student as an introduction to eye surgery and serve him later as a book of reference in his practice. The functional diseases of the eye, methods of examination, etc., are very well presented (partly with the help of Drs. J. Wallace and E. Jackson), but not at the expense of the organic diseases. The book is remarkable for the harmony of its parts, no pet subjects of the author encroaching upon the space of other parts. The experienced and older ophthalmic practitioner also will read the book with advantage, for repetition, the well-known mother of all studies, is most conveniently and satisfactorily done by the reading of a diligently written modern text-book. H. K.

The Diagnosis of Diseases of the Nervous System. A Manual for Students and Practitioners. By Dr. C. A. HERTER, New York. G. P. Putnam's Sons, New York and London, 1892. Price, $3.00.

No department of medicine is more closely allied to ophthalmology than neurology. Every oculist must have a working knowledge of neurology, and Dr. Herter's book is exactly what he wants to assist him in acquiring such knowledge. It has 628 small octavo pages, well printed, with numerous illustrations in the text. Acquaintance with the systematic anatomy and physiology of the nervous system is presupposed.

The first chapter, 68 pages, describes the *structure and functions of the nervous system* only with a view to their practical importance in diagnosis.

The second chapter (pp. 69–212) is exceedingly useful. It treats of the *symptoms of nerve disease in general and in particular;* for instance: paralysis, convulsions, tremor, fibrillation, rigidity, contraction, catalepsy, athetosis, inco-ordination, conjugate deviation of the eyes and head, strabismus, diplopia, nystagmus, ptosis, pupillary symptoms, abnormal reflex action, sensory symptoms, headache, olfactory symptoms, visual symptoms, amblyopia, defective field of vision, hemianopsia, opthalmoscopic changes, auditory symptoms, vertigo, trophic symptoms (altered electrical irritability of nerves and muscles, etc.), vaso-motor symptoms, mental symptoms, disturbances of speech (excellent, 12 pages), general symptoms (temperature, pulse, respiration, etc.).

The third chapter, *localization of the lesion*, is a corollary to the second, describing the symptoms to which the different lesions of the special parts of the nervous system give rise; for instance, the cortex cerebri, the white substance and centrum ovale, . . . optic thalamus, internal capsule, corpora quadrigemina, . . . medulla oblongata, the base of the brain, the spinal cord, the nerve roots, etc.

The fourth chapter treats of the *nature of the lesion*, hyperæmia, anæmia, hemorrhage, softening, thrombosis of sinuses, meningitis, abscess, tumor, degeneration. Half of this chapter is devoted to the *etiology of nervous disease*, heredity, abuses and excesses, toxic influences, infective diseases (tuberculosis, syphilis, diphtheria, etc.), reflex influences (rather short).

The fifth chapter, the *diagnosis of clinical types*, describes the special forms of disease from a clinical standpoint, particularly

dwelling on differential diagnosis, for instance, of intracranial tumor, nuclear ophthalmoplegia, disseminated sclerosis, general paralysis of the insane, hydrocephalus, diseases of the spinal cord and special nerves, all of which are described systematically and in detail.

The sixth chapter, the *distinction of functional and organic disease*, describes hysteria, traumatic neurosis and psycho-neurosis, neurasthenia, epilepsy, migraine, chorea, paralysis agitans, neuralgia, etc.

The seventh chapter treats of the *examination of the patient*, and

The eighth gives fifteen *illustrative cases*, with critical remarks, to drill the student.

If the reviewer adds to this enumeration of the contents of the book the statement that the subject is presented with the greatest precision and clearness, in an easy style, frequently as attractive as a novel, and brought up to the latest standpoint of this eminently interesting and progressive branch of medical science, he need not particularly recommend it to the readers of these ARCHIVES, for it seems to be specially designed for their need.

H. K.

MISCELLANEOUS NOTES.

538 BROAD ST., PROVIDENCE, R. I.

H. KNAPP, M.D., ED. ARCHIV. OPHTHAL.

DEAR SIR :—I enclose a copy of a law recently passed by our legislature relative to Ophthalmia. It is, I think, the third State to adopt it. Yours, truly,

F. T. ROGERS, M.D.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS.

CHAPTER 1056.

AN ACT FOR THE PREVENTION OF BLINDNESS.

Passed April 19, 1892.

It is enacted by the General Assembly as follows :

SECTION 1. Should any midwife or nurse, or person acting as nurse, having charge of an infant in this State, notice that one or both eyes of such infant are inflamed or reddened at any time within two weeks after its birth, Duties of midwife or nurse.

it shall be the duty of such midwife or nurse, or person acting as nurse, so having charge of such infant, to report the fact in writing within six hours to the health officer, or some qualified practitioner of medicine, of the city or town in which the parents of the infant reside.

Duties of health officer.

SEC. 2. Every health officer shall furnish a copy of this act to each person who is known to him to act as midwife or nurse in the city or town for which such health officer is appointed, and the Secretary of State shall cause a sufficient number of copies of this act to be printed, and supply the same to such health officers on application.

Penalty.

SEC. 3. Every person who shall fail to comply with the provisions of this act shall be fined not exceeding one hundred dollars, or imprisoned not exceeding six months, or both.

SEC. 4. This act shall take effect July 1st, 1892.

OFFICE OF THE SECRETARY OF STATE.
PROVIDENCE, R. I., May 11, 1892.

A true copy, Attest:

GEO. H. UTTER,
Secretary of State.

DR. AYRES' CHALAZION FORCEPS.

These forceps are made to facilitate the operation for chalazion. The ring is thin, and the plate fits into it so as press the tumor out and control all hemorrhage, while it is incised and curetted. The instrument is light and easily held by the left hand. Made by Max Wocher & Son, Cincinnati, O.

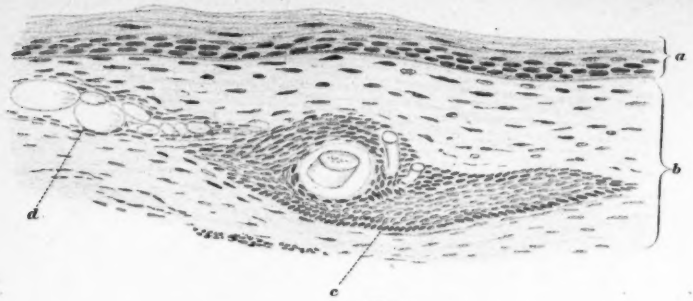
The HEIDELBERG OPHTHALMOLOGICAL SOCIETY will meet Aug. 7th–10th.

The meeting of GERMAN NATURALISTS AND PHYSICIANS will be held at Nürnberg from Sept. 12th–16th. Section of Ophthalmology Dr. v. Foster, Pres., Dr. Giulini, Sec'y.

Dr. SULZER has been appointed lecturer on ophthalmology at the University of Geneva, Switzerland.

MR. PRIESTLEY SMITH has been appointed professor of ophthalmology at Queen's College, Birmingham.

Fig. 1.



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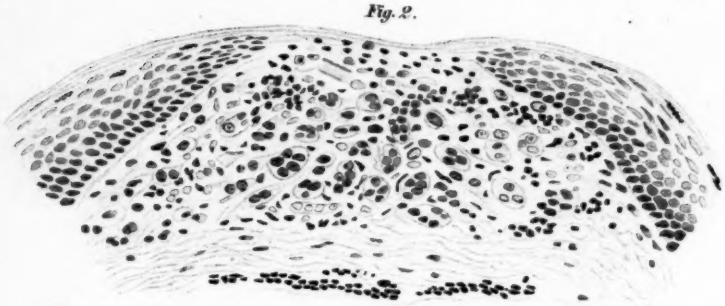
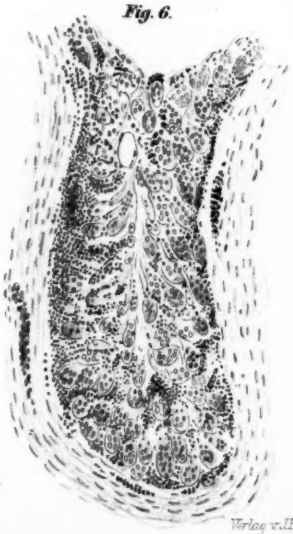


Fig. 3.

Fig. 6.



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Verlag v. J. F. Bergmann, Wiesb

Fig. 3.

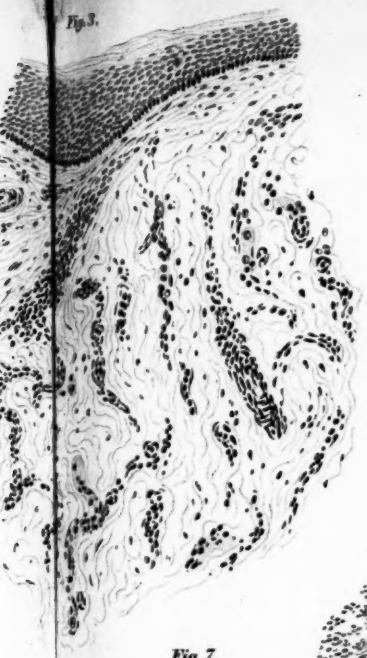
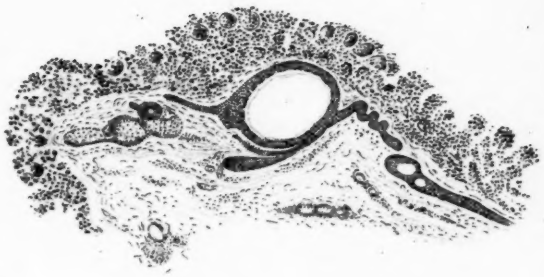


Fig. 4.

Fig. 13.



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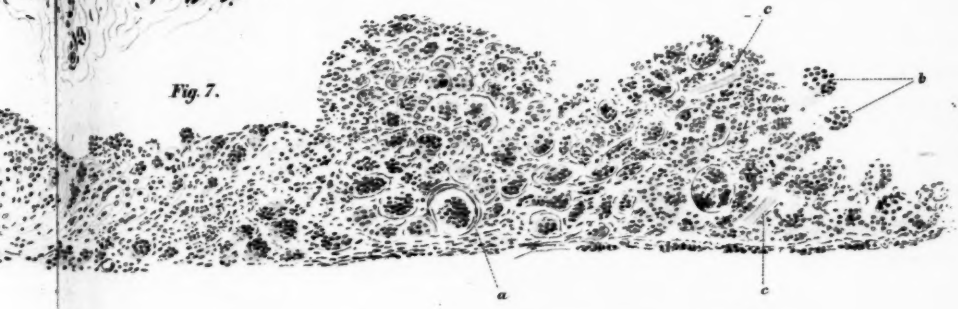

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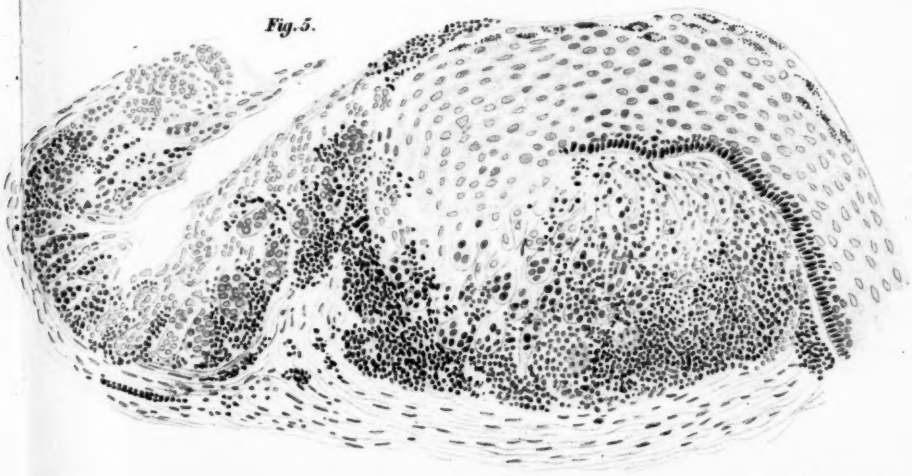
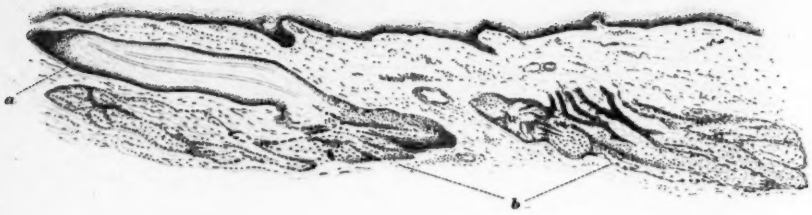


Lith. Anst. v. C. Kirst, Leipzig.

v. H. Bergmann, Wiesbaden.

Fig. 9.



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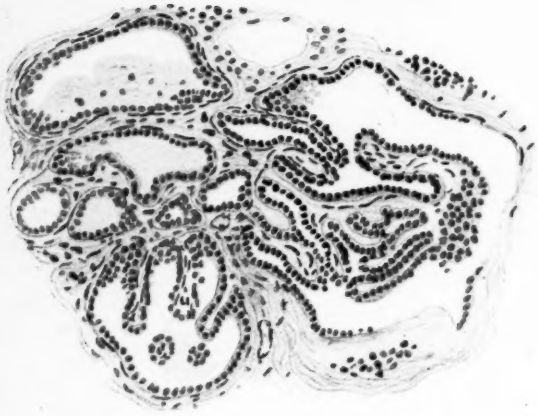

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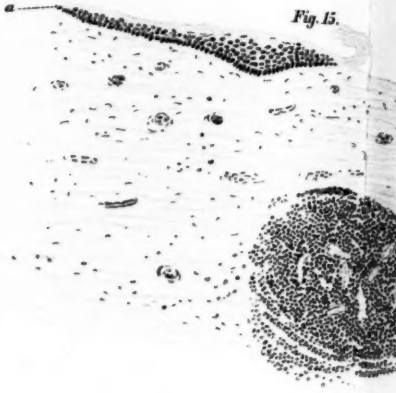

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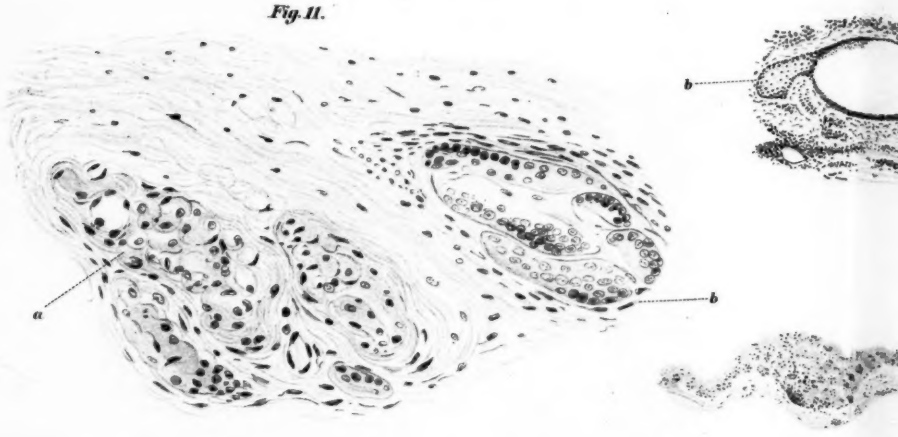

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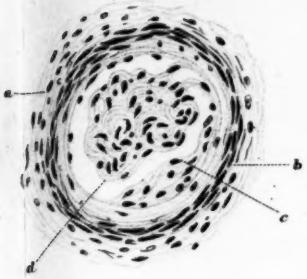

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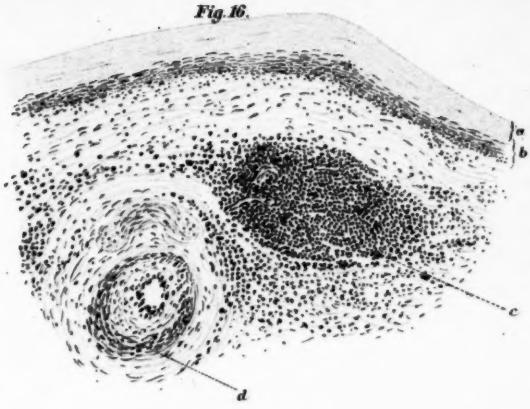

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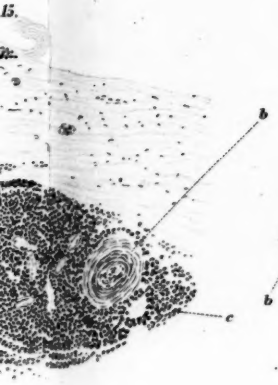

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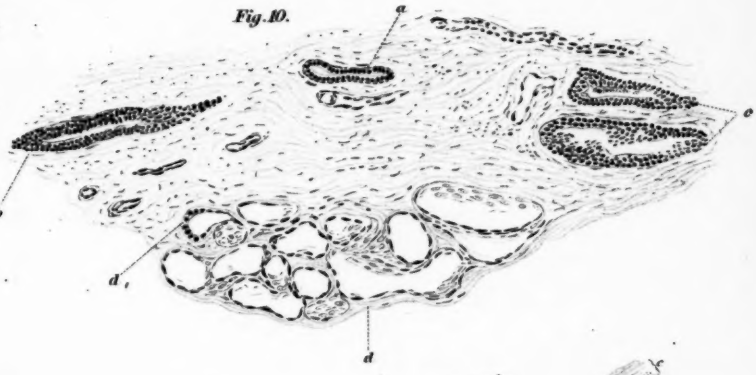

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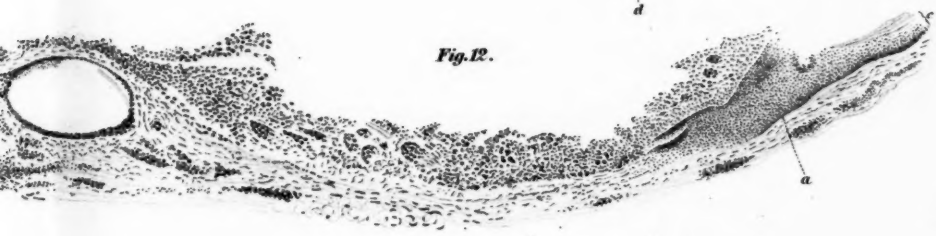

Fig. 14.

g. v. H. Bergmann, Wiesbaden.

Lith. Anst. v. C. Ernst, Leipzig